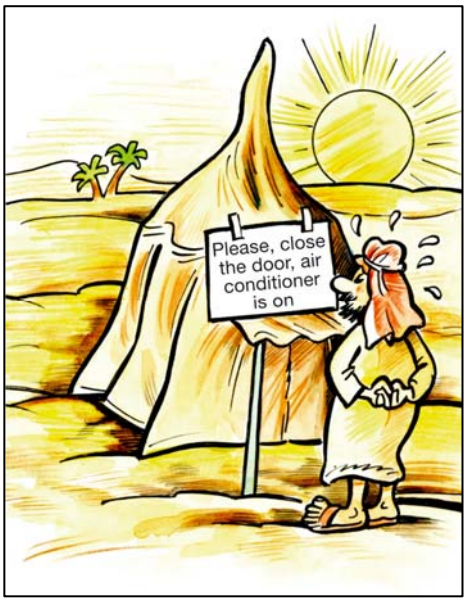
IUSES
Contract number:IEE/07/828/SI2.499427

IUSES

Intelligent Use of Energy at School



REPORT ON TESTING ACTIVITIES

August 2010

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IUSES
Contract number:IEE/07/828/SI2.499427

Summary report on students' and teachers' feedback in EUROPE

AREA Science Park

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0 Introduction

IUSES has developed a behaviour-oriented educational kit including 3 handbooks for students (respectively on buildings, transport and industry), a teachers' guidebook, multimedia animations, an experiment tool-kit and video and power point slides. The kit is available in the following languages: Bulgarian, Czech, Dutch, French, German, Greek, Irish, Italian, Latvian, Rumanian, Slovenian and Spanish. All the educational materials are freely available for downloading from the IUSES web site. IUSES has also launched the European Energy Saving Award (EESA), which is a key element for the success of the project. The aim was to reward all schools and individual students who have implemented energy efficiency and energy conservation measures, supporting changes in energy-related behaviours.

Teachers and students have been actively involved in all stages of the project. In particular, they have tested the educational material and provided their feedback and suggestions to improve the IUSES handbooks and kit. Teachers took part in courses organized at a national level in Austria, Bulgaria, Czech Republic, France, Greece, Ireland, Italy, Latvia, the Netherlands, Rumania, Slovenia and Spain by the local partners. A questionnaire was used before the testing started (October – December 2009) and a second assessment questionnaires was filled in after the use of the kit in March – May 2010. This methodology permitted to analyze the perception of the IUSES kit by students and teachers, collect suggestions for the improvement of the kit, and the impact the kit had on students' awareness and behaviours. The outcome of this analysis could be used also for the definition of further actions aimed at improving the energy efficiency of students' lifestyle.

About 330 teachers from more than 170 schools and 10.000 students were involved in the testing of the IUSES kit. The number of filled-in questionnaires is however smaller (about 200 questionnaires from teachers and a bit more than 3.000 from students). If teachers could be directly pressed to fill in questionnaires or being interviewed by phone, collecting students questionnaires depended on the teachers' active cooperation. The number of collected questionnaires however is still high and depicts a realistic and reliable description of the perception of the IUSES kit and its impact on the students.

1 Students feedback

1.1 Students details

Age	**%**
13	2
14	4
15	19
16	35
17	24
18	10
19 or more	5
Average age	16.3

The differences of the school systems in the different countries involved in the project caused a wide age-range of the students involved (from 13 to 19 or more). Nevertheless the average age is 16,3 and 78% of students is included in the 15-17 age-range for which the tool kit and in particular the handbooks are usually most suitable.

Gender	**%**
Male	52
Female	48

A little more males than females were involved in the testing because in some countries technical schools (that have a higher number of male students) were more interested in the IUSES toolkit. Indeed in the countries where there are no general schools but specialised schools, 37% came from technical schools and 21% from scientific schools.

1.2 Perception of energy consumption

What's the contribution of each of the following actions in saving energy (1 very low, 2 low, 3 fair, 4 high, 5 very high)	**Ex ante questionnaire average**	**Ex post questionnaire average**	**Difference**
Turning off light when nobody is in a room	3,8	3,9	0,1
Reducing heating	3,0	3,7	0,7
Switching off TV when nobody is watching it	3,6	3,7	0,1
Reducing cooling	3,2	3,5	0,2
Using low consumption light bulbs	3,7	3,9	0,2
Switching off stand-by mode of electric appliances	2,9	3,5	0,6
Choosing energy efficient appliances	3,1	3,7	0,6
Making a shower in spite of a bath	3,3	3,5	0,2
Driving the car in a environmental friendly way	2,8	3,3	0,5
Moving by foot or bike whenever possible	3,8	3,9	0,1
Buying local food	2,6	3,3	0,6

At a European level, the IUSES educational kit demonstrated that it is capable of increasing the perception of the significance of energy-related behaviour. The impact is variable from country to country due to the different starting point and to the cultural attitude towards the energy efficiency issue.

The increase in perception is higher in those items whose original perception (the questionnaire was given before and after the lessons made using the IUSES toolkit) were lower. That means that there were many behaviours that were disregarded by the students because they ignored their relevance. IUSES raised their awareness.

Variables such as gender, age or type of schools had a small impact that is moreover different from country so at a wide European level these factor haven't a significant impact on the answers provided by the students.

1.3 Students energy behaviour

How do you go to school?	Ex ante questionnaire %[1]	Ex post questionnaire %	difference
By foot or bicycle	39%	37%	-2%
By public transport	36%	30%	-6%
By motorbike	5%	5%	0%
By car	25%	24%	-1%
Using car sharing	7%	9%	2%

Surprisingly, students' ways of going to school don't seem to be affected by the IUSES educational kit. Several factors might have influenced such an outcome. The most important one is that in some countries multiple choices were allowed and this makes figures less comparable, since the number of answers provided in the ex ante and ex post questionnaires varies.

Also some students acquired a driving licence in the course of the testing period and so shifted to driving cars.

[1] Percentages might be higher than 100% since in many countries students were allowed to give multiple choice answers

A clearer and more positive trend and impact is however outlined in the following table:

Which of the following actions are you doing in your everyday life to save energy (you can choose more than one answer):	**Ex ante questionnaire %**	**Ex post questionnaire %**	**Difference**
Turning off light when I'm not in a room	77,5%	86,2%	+ 8,7%
Reducing heating	25,3%	34,9%	+ 9,6%
Switching off TV when nobody is watching it	66,7%	70,1%	+ 3,4%
Reducing cooling	17,5%	25,0%	+ 7,5%
Using low consumption light bulbs	41,3%	52,2%	+ 10,9%
Switching off stand-by mode of electric appliances	26,9%	39,6%	+ 12,7%
Choosing energy efficient appliances	20,2%	28,2%	+ 7,9%
Making a shower in spite of a bath	56,4%	62,5%	+ 6,2%
Driving the car in a environmental friendly way	13,3%	20,5%	+ 7,3%
Moving by foot or bike whenever possible	46,4%	52,0%	+ 5,6%
Buying local food	26,8%	29,3%	+ 2,5%

Even if the impact of the IUSES tool kit can change significantly from country to country, it's usually always positive and, at a European level it is always positive ranging from item to item from +2,5% to +12,7%.

Some items could be influenced by age (many students don't drive cars yet) or by climate (in some countries cooling is not widely used).

Items that are related to purchasing behaviour might also be influenced by the fact that students buy few thing and most of the appliances of their home are bought by their parents.

Nevertheless' behaviour that is influencing mostly comfort is usually ranking lower (heating, cooling, food, mobility) than those related to simpler behaviours (turning off lights, TV, shower etc.). In such cases too, there's still plenty of space for improvement. For example, a very simple behaviour as switching off the stand-by mode was originally 26,9% and increased to 39,6%.

IUSES had a major impact on the stand-by mode, low consumption energy bulbs, reducing heating and turning off lights.

1.4 Students & IUSES

Please evaluate IUSES handbooks giving a score according to the following scale :1 (very poor) - 5 (very good):	**Average**
Buildings handbook:	
Clearness	3,8
Usefulness of tips and hints for everyday life	3,8
Usefulness of contents for my future studies/job	3,5
Transport handbook:	
Clearness	3,8
Usefulness of tips and hints for everyday life	3,8
Usefulness of contents for my future studies/job	3,5
Industry handbook	
Clearness	3,5
Usefulness of contents for my future studies/job	3,4

Please indicate your agreement with the following statements (1 strongly disagree, 2 disagree, 3 neither agree nor disagree, 4 agree, 5 strongly agree):	Average
a) The IUSES experiments kit helped me in understanding the contents of the lessons.	3,7
b) The multimedia DVD helped me in understanding the contents of the lessons.	3,5

On average students appreciated the handbooks with a positive evaluation in particular in relation to their everyday life rather than future studies and jobs. The building and transport handbooks are appreciated more than the industry handbook probably because the latter is more distant from their everyday experience and, on the other hand, it is not a technical handbook that could be appreciated by the most technical students being an introduction to energy efficiency in industry.

The impact of age and gender is usually not clear and any deviation is not supported by sufficient statistical evidence.

Usually younger students appreciate the experiment toolkit and the multimedia more than older students.

2 Teachers feedback

2.1 Teachers details

In the countries where it was monitored, the average age of the teachers taking part in the testing was 46,7, therefore the teachers providing the project with their feedback are mostly experienced teachers with more than ten years of teaching experience. Their comments and remarks are thus highly qualified.

Type of school	%
technical	48
scientific	24
business	5
languages/art	22

Most of the teachers were teaching in technical or scientific schools. This was not an outcome of a selection carried out by partners but it's the result of a bigger interest from these schools for this topic.

2.2 Teaching Energy Efficiency using IUSES toolkit

On average 10,6 hours were devoted to teaching energy efficiency, with significant variations in the different countries average values: from 6 (Bulgaria and France) to 19,5 (Italy). This depends mostly on the flexibility of the national curricula and in the importance they grant to the energy issue.

Almost 10.000 students were taught energy efficiency using the IUSES toolkit.

Before using IUSES educational kit were you already teaching energy efficiency in your lessons?	**%**
No	29.9
Yes, but in a smaller number of hours	46,0
Yes, in the same number of hours	24,1

The IUSES project contributed to increasing and supporting the teaching of energy efficiency in schools since 29,9% of the teachers involved in IUSES activities were not teaching it before and 46% increased the number of hours devoted to it.

Please indicate your agreement with the following statements (1 strongly disagree, 2 disagree, 3 neither agree nor disagree, 4 agree, 5 strongly agree)	**Average**
IUSES Teachers guidebook helps teachers in preparing their lessons	4,2
IUSES Teachers guidebook gives useful information in setting up an energy saving plan	4,3

Teachers appreciate the teachers' guidebook as a support in their teaching activities, even if they are demanding more suggestions on the use of the students' handbooks and in the definition of the different educational pathways.

Please evaluate IUSES handbooks giving a score according to the following scale :1 (very poor), 2 (poor), 3 (fair), 4 (good) 5 (very good):	**Average**
Buildings handbook:	
Clearness	4,1
Usefulness of tips and hints for everyday life	4,1
Usefulness of contents for students future studies/job	3,8
Transport handbook:	
Clearness	4,1
Usefulness of tips and hints for everyday life	4,0
Usefulness of contents for students future studies/job	3,6
Industry handbook	
Clearness	4,0
Usefulness of contents for students future studies/job	3,6

Teachers evaluate the handbooks more positively than their students. Probably a generation gap makes them more acquainted to books than their students.

It's interesting that all the three handbooks report similar evaluations. Probably teachers due to their professional experience can better appreciate the value of the industry handbook which is not adequately perceived by students since it's far from their everyday experience.

A common remark is that the handbooks are too large and have more information than teachers can teach.

Please indicate your agreement with the following statements (1 strongly disagree, 2 disagree, 3 neither agree nor disagree, 4 agree, 5 strongly agree):	Average
IUSES experiments kit help students in understanding the contents of the lessons.	4,3
The multimedia DVD help students in understanding the contents of the lessons	4,1

91% of the teachers will use the IUSES educational kit also next year and the same percentage would suggest it to a colleague.

2.3 Teachers behaviour

Going to school (multiple choice possible):	A year ago (%)	After using IUSES toolkit	Difference
By foot or bicycle	28%	34%	+6%
By public transport	25%	21%	-4%
By motorbike	11%	11%	0%
By car	44%	37%	-7%
By car sharing	11%	14%	+3%

The IUSES toolkit had a positive impact on the way teachers went to school.

Which of the following actions have you begun to do after teaching energy efficiency in your everyday life to save energy (multiple answer possible):	%
Turning off light when I'm not in a room	61,76%
Reducing heating	33,37%
Switching off TV when nobody is watching it	54,37%
Reducing cooling	22,77%
Using low consumption light bulbs	57,53%

Switching off stand-by mode of electric appliances	44,74%
Choosing energy efficient appliances	47,09%
Making a shower in spite of a bath	41,70%
Driving the car in a environmental friendly way	30,63%
Moving by foot or bike whenever possible	46,78%
Buying local food	35,78%

IUSES had a positive impact also on other teachers' behaviour. That means that teachers in teaching energy efficient behaviours to their students realized that in order for them to be credible, they should enforce these actions personally.

3 Conclusions

The comparison between students and teachers behaviour demonstrate a generation gap that underlines the importance of acting on students' behaviour since they are used to lifestyles and comfort levels that are much more energy demanding than those of the previous generations. Such difference is indeed not due to attitude (most surveys say that young people are sensitive to environmental issues) but from a richer lifestyle they got used to in their early childhood. So, in a long term perspective, actions aimed at making students more aware of the energy and environmental impact of their behaviour are extremely important.

Technical and scientific schools are more interested than others in the energy topic, but also other schools can be involved in these topics.

The multimedia and experiment kit are suggested more for younger students and not for technical schools.

Teachers' and students' feedback demonstrate a positive evaluation of the kit and the most significant datum is that 91% of the teachers is going to use it next year and would suggest it to other teachers. This a very positive datum also because word of mouth is one of the most efficient dissemination tool.

The teachers' guidebook will be improved in order to provide some more guidance in building up their educational path, since they have been confused by the very large amount of information available in the handbooks. It will be more clearly explained that they are not expected to use all the available information (at least not in one school year) but to choose those topics that are more relevant for their students and that better suit their curricula.

The power point slides, originally foreseen as a mere supporting element of the kit, proved to be very appreciated by most of the teachers. Further dissemination activities should stress the availability of this tool.

The educational kit is freely available on the IUSES web site and it can be freely used and downloaded by any teachers willing to teach energy efficiency to their students.

A remarkable outcome of the testing id that the IUSES tool kit was able to positively impact energy behaviour at home but it had a quite smaller impact on the transport behaviour of the students.

We therefore suggest that further educational activities or awards should focus on students mobility which is also a topic that is more manageable than the energy efficiency of schools that are usually owned and managed by local authorities rather than the school itself. On the other hand, schools can influence the way students go to school with specific educational and awareness-raising campaigns aimed at influencing students and their families' mobility behaviour.

A common remarks collected from teachers from different countries is that the contents of the IUSES educational kit if embedded in an overall school energy saving plan should be included in a project lasting more than a single school year since implementing an energy saving plan in a school requires a lot of bureaucratic steps, the involvement of several actors and the time available for students and teachers is very small.

Therefore we suggest, for further projects and initiatives aimed at teaching energy efficiency in schools, at planning activities in a longer period of time.

Report on testing activities in AUSTRIA

MUL - University of Leoben

Author: Hannes Kern

0 Introduction

Throughout Austria there where 10 schools from all over the country with 12 teachers involved in the testing activities of the IUSES toolkit. Not all schools participating in the IUSES project also took part in the testing phase but 176 students gave their feedback by working trough the questionnaire.
The timeframe in which the testing occurred depended on the schools and the teachers, varying from 3 months down to 4 weeks between the two questionnaire sheets. This may be a bit problematic, because the results are not that comparable because of this variation in the testing time.

1 Students feedback

1.1 Students details

Age	**%**
14	
15	
16	46,02
17	43,18
18	7,95
19	2,85
Average age	

Gender	**%**
Male	42,05
Female	57,95

Type of school	**%**
technical	18,75
scientific	35,80
business	
languages/art	45,45

1.2 Perception of energy consumption

What's the contribution of each of the following actions in saving energy (1 very low, 2 low, 3 fair, 4 high, 5 very high)		
	Ex ante questionnaire average	**Ex post questionnaire average**
Turning off light when nobody is in a room	3,25	2,84
Reducing heating	3,60	3,32
Switching off TV when nobody is watching it	3,33	2,96
Reducing cooling	3,64	3,49
Using low consumption light bulbs	3,33	2,86
Switching off stand by mode of electric appliances	3,33	3,17
Choosing energy efficient appliances	3,42	3,25
Making a shower in spite of a bath	3,16	2,85
Driving the car in a environmental friendly way	3,28	2,60
Moving by foot or bike whenever possible	4,27	2,94
Buying local food	3,25	3,56

Comparing the results of the questions aiming at the change in behaviour of the students, no significant changes can be observed. In the "transportation sector" the effect seems to be quite a bit reverse. That could be an effect of the "mobilisation" of the students. For example when they get their first driving licences at the age of 17 , students tends to be more keen on driving than in saving energy.

Any impact of gender, age or school type has not been observed

1.3 Students energy behaviour

How do you go to school?	Ex ante questionnaire %	Ex post questionnaire %
By foot or bicycle	39,20	25,00
By public transport	57,39	52,27
By motorbike	4,55	5,11
By car	47,16	22,73
Using car sharing	2,27	0,00

Which of the following actions are you doing in your everyday life to save energy (you can choose more than one answer):	Ex ante questionnaire %	Ex post questionnaire %
Turning off light when I'm not in a room	87,50	89,20
Reducing heating	30,11	27,84
Switching off TV when nobody is watching it	80,68	84,66
Reducing cooling	17,05	15,91
Using low consumption light bulbs	28,98	25,00
Switching off stand by mode of electric appliances	43,75	36,36
Choosing energy efficient appliances	13,64	13,64
Making a shower in spite of a bath	70,45	65,34
Driving the car in a environmental friendly way	24,43	20,45
Moving by foot or bike whenever possible	43,75	34,09
Buying local food	25,57	26,70

Even if students' behaviour did not change significantly, generally it can be assumed that in many categories students show good behaviour in energy saving. Some of the students tried to involve their family in energy saving measures. Effects and impacts seem to be quite homogeneously distributed all over the participating.

Gender effects have not been detected.

1.4 Students & IUSES

Please evaluate IUSES handbooks giving a score according to the following scale :1 (very poor), 2 (poor), 3 (fair), 4 (good) 5 (very good):	**Average**
Buildings handbook:	
Clearness	4,06
Usefulness of tips and hints for everyday life	3,46
Usefulness of contents for my future studies/job	3,18
Transport handbook:	
Clearness	3,89
Usefulness of tips and hints for everyday life	3,54
Usefulness of contents for my future studies/job	2,98
Industry handbook	
Clearness	3,57
Usefulness of contents for my future studies/job	3,31
Usefulness of contents for my future studies/job	2,76

Please indicate your agreement with the following statements (1 strongly disagree, 2 disagree, 3 neither agree nor disagree, 4 agree, 5 strongly agree):	**Average**
a) The IUSES experiments kit helped me in understanding the contents of the lessons.	3,11
b) The multimedia DVD helped me in understanding the contents of the lessons.	3,04

Where did you use the multimedia DVD?	**%**
At school	91,56
At home	
At school and at home	8,44

In general students liked the toolkit and mostly referred positively about it. Most of them complained that the handbooks were too long and that they should be more essential. Furthermore there is not enough time during the lectures to work through the whole books. Students from technical schools complained that the experimental toolkit did not meet completely their expectations. On the contrary a lot of students liked the part about the paper industry in the "Industry Handbook".

Cultural or educational influences have not been observed.

Gender or school type seemed not to have any effect on the answers.

Most of the students stated that the kit was well elaborated but containing a lot of information. It might be necessary to better work out the essentials of the energy saving and energy efficiency issues to make the information more effective for the students.

2 Teachers feedback

2.1 Teachers details

The average age of teachers is 43,9 years. There are not so many junior teachers involved.

75% of the teachers involved are males. Most of the teachers are from schools with scientific or linguistic backgrounds. As it can be seen in the tables below, a lot of physics and chemistry teachers where participating in the IUSES project. This can be easily explained by the fact that energy topic in Austria is strongly related to physics lessons in national curricula.

Type of school	**%**
technical	16,67
scientific	41,67
business	
languages/art	41,67

Which subject are you teaching:	**%**
Technology	16,67
Biology, chemistry	33,33
Physics	41,67
Math	16,67
Literature, history, philosophy	
Foreign language	16,67
Art	8,33
Other (specify)	

In Austria normally teachers teach two subjects, so some teachers marked two subjects in the questionnaire.

2.2 Teaching Energy Efficiency using IUSES toolkit

Teachers devoted 6,5 hours in average on teaching energy efficiency. The problem of the implementation of new topics during their lessons is related to the fact that teachers have a strict time plan and relatively little time to spend on new projects. The basic approach proposed in the

"teachers guidebook" demands 8 hours time for the basic course, and this was hard to achieve in Austria.

Besides some problems in the time coordination, about 250 students were trained thanks to the IUSES toolkit, even if not all of them participated in the testing phase.

Before using IUSES educational kit were you already teaching energy efficiency in your lessons?	**%**
No	66,67
Yes, but in a smaller number of hours	16,67
Yes, in the same number of hours	16,67

Please indicate your agreement with the following statements (1 strongly disagree, 2 disagree, 3 neither agree nor disagree, 4 agree, 5 strongly agree)	**Average**
IUSES Teachers guidebook helps teachers in preparing their lessons	4,44
IUSES Teachers guidebook gives useful information in setting up an energy saving plan	4,22

Teachers were quite confident with the provided material, but some of them remarked that the proposed energy saving plan often was hard to implement because of the lack of time .

Please evaluate IUSES handbooks giving a score according to the following scale :1 (very poor), 2 (poor), 3 (fair), 4 (good) 5 (very good):	**Average**
<u>Buildings handbook:</u>	
Clearness	4,33

Usefulness of tips and hints for everyday life	4,42
Usefulness of contents for my future studies/job	4,17
Transport handbook:	
Clearness	4,08
Usefulness of tips and hints for everyday life	4,17
Usefulness of contents for my future studies/job	3,92
Industry handbook	
Clearness	4,42
Usefulness of tips and hints for everyday life	4,08
Usefulness of contents for my future studies/job	4,25

Teachers liked the handbooks and remarked that they contained a lot of useful tips for everyday life and also for the future of their students. Teachers from technical schools liked most the chapter about the paper industry. Some other teachers affirmed that the handbooks contained a lot of information and this allows students to find out more detailed information on the topics they are interested in.

Please indicate your agreement with the following statements (1 strongly disagree, 2 disagree, 3 neither agree nor disagree, 4 agree, 5 strongly agree):	**Average**
IUSES experiments kit help students in understanding the contents of the lessons.	4,00
The multimedia DVD help students in understanding the contents of the lessons	4,08

Where did the students use the multimedia DVD?	**%**
At school	**75,00**
At home	
At school and at home	**25,00**

As mentioned above, all teachers were confident with the provided material and they would also suggest it to their colleagues. All of them will use it next year, and they will try to spend more time on teaching the energy efficiency issue.

Two schools are going to implement an energy saving plan. For both schools the energy saving plan will not be carried out by themselves but by a contracting company.

In general teachers are confident with the IUSES kit and they would not add anything. Some teachers proposed to better elaborate the essential information to make it easier for students to work through this information.

Any influences of age, gender, type of school or anything similar have been observed. Generally it can be said that the influence depends more on the teacher than on the type of school or subject.

2.3 Teachers behaviour

Going to school:	**A year ago (%)**	**After using IUSES toolkit**
By foot or bicycle	22,22	22,22
By public transport	11,11	11,11
By motorbike	11,11	11,11
By car	88,89	88,89
By car sharing		

Which of the following actions have you begun to do after teaching energy efficiency in your everyday life to save energy (multiple answer possible):	**%**
Turning off light when I'm not in a room	88,89
Reducing heating	66,67
Switching off TV when nobody is watching it	66,67
Reducing cooling	
Using low consumption light bulbs	55,56
Switching off stand by mode of electric appliances	44,44
Choosing energy efficient appliances	88,89
Making a shower in spite of a bath	33,33
Driving the car in a environmental friendly way	33,33
Moving by foot or bike whenever possible	66,67
Buying local food	88,89

More than 50% of the teachers respected the basic energy saving procedures and they showed energy efficient behaviours.

With reference to their transport behaviours no significant changes took place. It can be assumed that in relation to the energy efficiency issue, no significant changes can be expected in a short period of time. However terms of transport, most of the teachers have optimized their personal transport behaviour, and they adapted it according to the place they live.

3 Conclusions

Both teachers and students are confident with the IUSES. The principle remark is that there is a lot of information to be dealt with, which makes it hard for the students to gain access to the essentials. Teachers generally liked the handbooks more than the students themselves. Teachers seemed to appreciate the whole spectra of information. The answers of students and teachers are coherent and there are no significant differences.

A bit of a differences could be seen in behavioural measures. Teachers seemed to be more familiar with energy saving than students. This could be explained by an "age effect" and also by the fact that teachers interested in the IUSES kit have spent time investigating on energy efficiency and

energy saving measures. Most of the teachers participating in the IUSES project confirmed that they were interested for this matter in general.

In general it can be said that the following lessons should be learnt:

- The IUSES kit provides sufficient information for teachers and students
- The essential information should be elaborated more easily for the students
- It is hard to meet all needs of the different types of schools
- Timeframe for the testing should have been longer

All the practical works suggested in the kit worked well especially for technical schools**.** Also the other schools referred to the toolkit in a very positive way. Teachers really need to be supported by materials and educational resources as the ones contained in the IUSES toolkit to make some complex matter more understandable for their students.

Report on testing activities in BULGARIA

University of Ruse

Author: Kiril Barzev

0 Introduction

Please provide the following information:
Schools involved: 13
Number of filled in questionnaires by students: 221
Number of filled in questionnaires by teachers: 18
Timeframe in which testing occurred: February 2010 – May 2010

1 Students feedback

1.1 Students details

Age	**%**
14	1.3
15	6.7
16	22.9
17	47.5
18	21.6
Average age	

Gender	**%**
Male	62
Female	38

Type of school	**%**
technical	59
scientific	10
business	-
languages/art	31

1.2 Perception of energy consumption

What's the contribution of each of the following actions in saving energy (1 very low, 2 low, 3 fair, 4 high, 5 very high)		
	Ex ante questionnaire average	**Ex post questionnaire average**
Turning off light when nobody is in a room	3.2	3.72
Reducing heating	3.2	3.86
Switching off TV when nobody is watching it	3.0	3.42
Reducing cooling	2.8	3.27
Using low consumption light bulbs	3.3	3.68
Switching off stand by mode of electric appliances	2.9	3.46
Choosing energy efficient appliances	2.8	3.37
Making a shower in spite of a bath	3.0	3.43
Driving the car in a environmental friendly way	3.3	3.70
Moving by foot or bike whenever possible	3.8	3.91
Buying local food	2.7	3.41

Add your comments, in particular the use of the IUSES toolkit had some impact on students perception of energy consumption?

The IUSES toolkit has had a positive impact on students' perception of energy consumption.

Does age, gender or type of school have an impact on the provided answers?

The older students from technical schools have more specific knowledge and they are oriented to the essence of the subject-matter.

1.3 Students energy behaviour

How do you go to school?	Ex ante questionnaire %	Ex post questionnaire %
By foot or bicycle	50.5	52.4
By public transport	39.1	40.2
By motorbike	2.4	1.0
By car	5.0	3.6
Using car sharing	3.0	3.0

Which of the following actions are you doing in your everyday life to save energy (you can choose more than one answer):	Ex ante questionnaire %	Ex post questionnaire %
Turning off light when I'm not in a room	38.0 88.0	88.0
Reducing heating	15.0	35.0
Switching off TV when nobody is watching it	32.0	42.0
Reducing cooling	8.0	35.0
Using low consumption light bulbs	17.0	53
Switching off stand by mode of electric appliances	14.0	31.0
Choosing energy efficient appliances	4.0	31.0
Making a shower in spite of a bath	27.0	53.0
Driving the car in a environmental friendly way	5.0	14.0
Moving by foot or bike whenever possible	36.0	49.0
Buying local food	8.0	34.0

Add your comments, in particular the use of the IUSES toolkit had some impact on students behaviour of energy consumption? Did they involve someone else in their energy saving actions?

The results are showing that the IUSES toolkit had some impact on students' behaviour of energy consumption.

1.4 Students & IUSES

Please evaluate IUSES handbooks giving a score according to the following scale :1 (very poor), 2 (poor), 3 (fair), 4 (good) 5 (very good):	**Average**
Buildings handbook:	
Clearness	4.38
Usefulness of tips and hints for everyday life	4.26
Usefulness of contents for my future studies/job	4.31
Transport handbook:	
Clearness	4.35
Usefulness of tips and hints for everyday life	4.22
Usefulness of contents for my future studies/job	4.30
Industry handbook	
Clearness	4.36
Usefulness of contents for my future studies/job	4.27

Please indicate your agreement with the following statements (1 strongly disagree, 2 disagree, 3 neither agree nor disagree, 4 agree, 5 strongly agree):	Average
a) The IUSES experiments kit helped me in understanding the contents of the lessons.	4.29
b) The multimedia DVD helped me in understanding the contents of the lessons.	4.25

Where did you use the multimedia DVD?	%
At school	69%
At home	
At school and at home	31%

Please add your comments: what's the overall evaluation of the tool kit by the students?

The results are showing that the IUSES toolkit had some impact on students' behaviour of energy consumption.

2 Teachers feedback

2.1 Teachers details

General data about teachers: average age (are they mostly senior or junior teachers?), gender (% of male, female)

Type of school	%
technical	64
scientific	18
business	
languages/art	18

Which subject are you teaching:	%
Technology	50
Biology, chemistry	21
Physics	29
Math	
Literature, history, philosophy	
Foreign language	
Art	
Other (specify)	

In the above table also answers from question 6 is included

Is any other relevant background information to be provided?

2.2 Teaching Energy Efficiency using IUSES toolkit

Please provide:

Number of hours devoted to teaching energy efficiency: 6 hours of average

Number of students trained using IUSES toolkit: 1.615 students

Before using IUSES educational kit were you already teaching energy efficiency in your lessons?	%
No	
Yes, but in a smaller number of hours	82
Yes, in the same number of hours	18

Please indicate your agreement with the following statements (1 strongly disagree, 2 disagree, 3 neither agree nor disagree, 4 agree, 5 strongly agree)	**Average**
IUSES Teachers guidebook helps teachers in preparing their lessons	4.45
IUSES Teachers guidebook gives useful information in setting up an energy saving plan	4.5

Please summarize teachers comments on the question and in case add you comments

Teachers evaluated with higher degrees the usefulness of the IUSES toolkit, compared with those of students.

Please evaluate IUSES handbooks giving a score according to the following scale :1 (very poor), 2 (poor), 3 (fair), 4 (good) 5 (very good):	**Average**
Buildings handbook:	
Clearness	4.5
Usefulness of tips and hints for everyday life	4.6
Usefulness of contents for my future studies/job	4.72
Transport handbook:	
Clearness	4.6
Usefulness of tips and hints for everyday life	4.54
Usefulness of contents for my future studies/job	4.6

Industry handbook	
Clearness	4.36
Usefulness of contents for my future studies/job	4.36

Please summarize teachers comments on the question and in case add you comments

Please indicate your agreement with the following statements (1 strongly disagree, 2 disagree, 3 neither agree nor disagree, 4 agree, 5 strongly agree):	**Average**
IUSES experiments kit help students in understanding the contents of the lessons.	4.63
The multimedia DVD help students in understanding the contents of the lessons	4.5

Where did the students use the multimedia DVD?	**%**
At school	82.0
At home	
At school and at home	18.0

How many teachers would suggest other teachers to use IUSES educational kit? (question 18)

About 50% of teachers would suggest other teachers to use IUSES educational kit.

How many teachers are going to use IUSES educational toolkit next year? (question 19)

About 65% of teachers are going to use the IUSES educational toolkit next year.

How many schools are going to implement energy saving plan? 12 schools Summarize briefly details (question 20)

Changing woodwork with PVC.

Removing the incandescent lights and replacing with compact fluorescent bulbs and low consumption light bulbs.

Ensuring that energy is not wasted by using more equipment than necessary.

Insulation of the school ceiling.

Using more renewable energy sources.

Changing fuel type.

Summarize final suggestions (question 21) and add your comments.

To use low consumption light bulbs.

To design a computer game, connected with energy efficiency, which would be used to teach students in a more attractive way.

Is the type of school, subjects taught, age or gender of teachers influencing the answers provided by teachers?

2.3 Teachers behaviour

Going to school:	**A year ago (%)**	**After using IUSES toolkit**
By foot or bicycle	37	63
By public transport	55	45
By motorbike	-	-
By car	60	40
By car sharing	-	-

Which of the following actions have you begun to do after teaching energy efficiency in your everyday life to save energy (multiple answer possible):	**%**
Turning off light when I'm not in a room	91
Reducing heating	27
Switching off TV when nobody is watching it	91

Reducing cooling	27
Using low consumption light bulbs	82
Switching off stand by mode of electric appliances	54
Choosing energy efficient appliances	54
Making a shower in spite of a bath	27
Driving the car in a environmental friendly way	18
Moving by foot or bike whenever possible	91
Buying local food	45

Is teachers behaviour energy efficient?

It is appears clearly that the teachers behaviour is energy efficient.

Did IUSES have an impact on their behaviour?

Yes

Make your comments

From the above results we can see that after using the IUSES educational kit, teachers started to implement almost all activities leading to energy efficiency.

3 Conclusions

Compare teachers with students answers. Are they coherent? Is any significant difference?

The feedback, obtained from students and teachers answers seems to be similar and coherent.

What worked best?

Students have understood very well all measures leading to energy saving at home. Furthermore, they have changed their way to go to school even if in Bulgaria public transport are commonly used both by students and teachers.

Report on testing activities in CZECH REPUBLIC

ENVIROS - s.r.o.

Author: Vlasta Švejnohová

0 Introduction

Schools involved: 22
Number of filled in questionnaires by students: 404 (258 before + 146 after)
Timeframe in which testing occurred: April 2010 – May 2010
Any other remarks about the framework in which the testing occurred: when the questioning started the DVD was not available so the testing occurred in two different phases

1 Students feedback

1.1 Students details

Age	%
14	0,0%
15	8,2%
16	24,8%
17	28,5%
18	22,3%
19	9,2%
20	4,0%
21	1,7%
22	0,7%
Average age	17,2

Gender	%
Male	49,8%
Female	50,2%

Type of school	%
technical	29,7%
scientific	38,1%
business	32,2%
languages/art	0,2%

1.2 Perception of energy consumption

What's the contribution of each of the following actions in saving energy (1 very low, 2 low, 3 fair, 4 high, 5 very high)		
	Ex ante questionnaire average	**Ex post questionnaire average**
Turning off light when nobody is in a room	3,6	3,6
Reducing heating	3,2	3,1
Switching off TV when nobody is watching it	3,5	3,5
Reducing cooling	3,0	2,9
Using low consumption light bulbs	3,6	3,6
Switching off stand by mode of electric appliances	2,8	2,7
Choosing energy efficient appliances	3,2	3,0
Making a shower in spite of a bath	2,9	3,0
Driving the car in a environmental friendly way	2,6	2,7
Moving by foot or bike whenever possible	3,4	3,1
Buying local food	2,6	2,6

The differences in the evaluation are imperceptible. The IUSES toolkit taught students about "Driving the car in an environmental friendly way" which we suppose was not usual, common or known in Czech Republic.

Answers summarized by age: **Ex ante questionnaire average**

Age	15	16	17	18	19	20	21	22
Turning off light when nobody is in a room	3,8	3,6	3,7	3,4	3,4	2,9	4,5	5,0
Reducing heating	3,4	3,3	3,0	2,9	2,8	3,8	3,5	5,0
Switching off TV when nobody is watching it	3,8	3,7	3,5	3,0	3,2	2,4	4,0	5,0
Reducing cooling	3,0	2,9	2,9	3,1	3,2	2,6	4,0	3,0
Using low consumption light bulbs	3,5	3,5	3,5	3,8	3,8	3,2	4,5	4,0
Switching off stand by mode of electric appliances	2,6	2,8	2,9	2,6	2,7	2,6	3,0	3,0
Choosing energy efficient appliances	2,9	3,2	3,3	3,2	3,0	2,9	4,3	2,5
Making a shower in spite of a bath	2,8	2,7	3,0	3,1	2,8	3,4	2,5	3,0
Driving the car in a environmental friendly way	3,0	2,5	2,8	2,2	2,8	3,0	3,3	3,5
Moving by foot or bike whenever possible	3,8	3,5	3,2	3,2	3,3	3,6	3,3	3,0
Buying local food	2,9	2,7	2,8	2,2	2,2	2,4	3,3	2,0

Answers summarized by age: **Ex post questionnaire average**

Age	15	**16**	**17**	**18**	19	20	21	22
Turning off light when nobody is in a room	4,3	3,2	3,4	3,6	3,7	3,3	3,0	4,0
Reducing heating	3,0	2,9	2,9	3,3	3,0	3,1	3,0	5,0
Switching off TV when nobody is watching it	5,0	3,3	3,5	3,1	3,4	3,8	2,7	4,0
Reducing cooling	3,7	2,6	2,9	3,1	2,5	2,9	3,0	3,0
Using low consumption light bulbs	5,0	3,3	3,3	3,7	3,7	3,6	4,7	3,0
Switching off stand by mode of electric appliances	2,7	2,4	2,8	2,8	2,3	2,7	1,3	3,0
Choosing energy efficient appliances	3,7	2,9	2,7	3,3	2,8	3,1	4,7	3,0
Making a shower in spite of a bath	4,0	2,5	2,7	3,4	2,4	3,0	3,0	2,0
Driving the car in a environmental friendly way	2,7	2,6	2,8	2,7	2,2	2,9	2,3	2,0
Moving by foot or bike whenever possible	3,0	3,2	2,9	3,4	2,6	2,9	3,0	2,0
Buying local food	3,3	2,5	2,6	2,5	2,1	3,3	3,7	2,0

Students at the age of 15 after using IUSES increased their evaluation of contribution of almost each of the actions in saving energy.

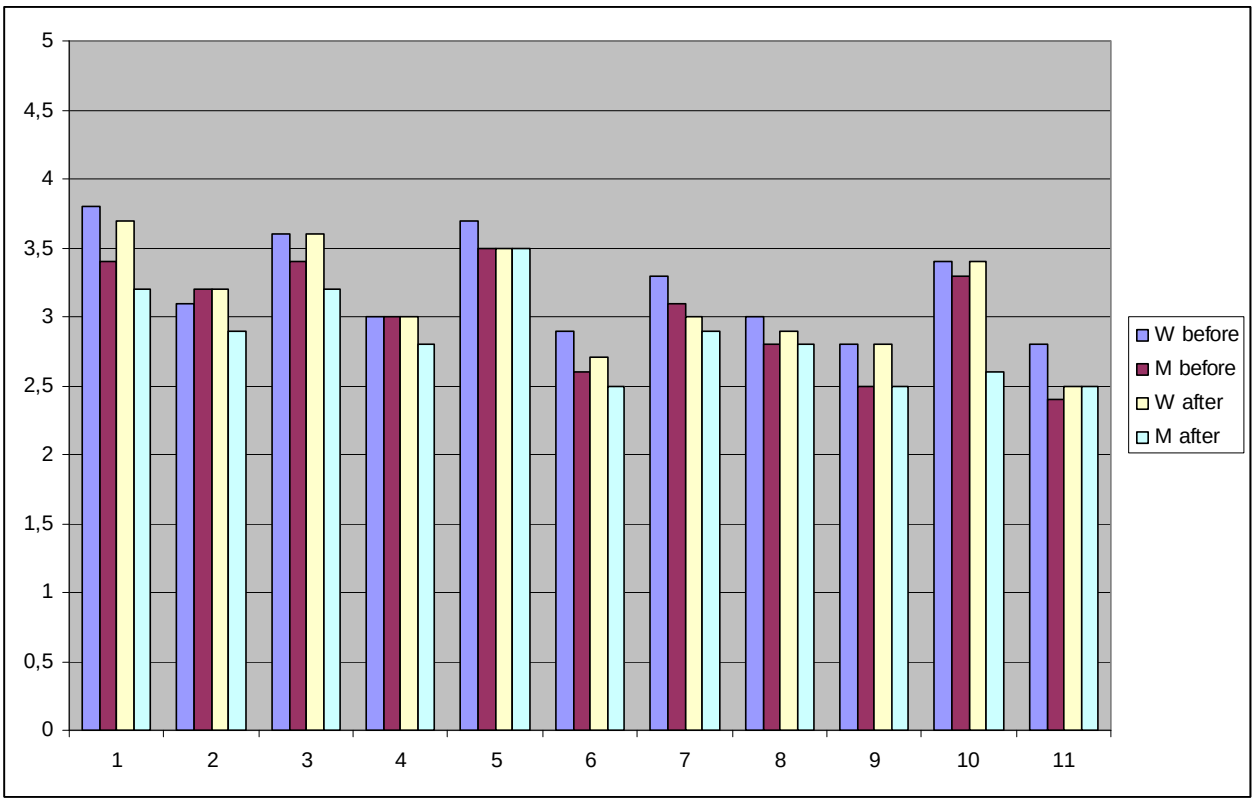
Students at the age of 16 and 17 after using IUSES slightly decreased their evaluation of contribution of almost each of the actions in saving energy.

Students at the age of 18 after using IUSES slightly increased their evaluation of contribution of almost each of the actions in saving energy.

But changes are imperceptible.

Answers summarized by gender:

Gender	**Ex ante questionnaire average**		**Ex post questionnaire average**	
	W	M	W	M
Turning off light when nobody is in a room	3,8	3,4	3,7	3,2
Reducing heating	3,1	3,2	3,2	2,9
Switching off TV when nobody is watching it	3,6	3,4	3,6	3,2
Reducing cooling	3,0	3,0	3,0	2,8
Using low consumption light bulbs	3,7	3,5	3,5	3,5
Switching off stand by mode of electric appliances	2,9	2,6	2,7	2,5
Choosing energy efficient appliances	3,3	3,1	3,0	2,9
Making a shower in spite of a bath	3,0	2,8	2,9	2,8
Driving the car in a environmental friendly way	2,8	2,5	2,8	2,5
Moving by foot or bike whenever possible	3,4	3,3	3,4	2,6
Buying local food	2,8	2,4	2,5	2,5



Conclusion: Women generally gave higher evaluations than men to all the energy saving actions.

Answers summarized by type of school:

Type of school	**Ex ante questionnaire average**				**Ex post questionnaire average**			
	technical	scientific	business	Linguistic /art	technical	scientific	business	Linguistic /art
Turning off light when nobody is in a room	3,3	3,6	3,9	Not relevant	3,0	3,5	3,8	Not relevant
Reducing heating	3,3	3,2	2,9	Not relevant	2,8	3,1	3,3	Not relevant
Switching off TV when nobody is watching it	3,2	3,6	3,6	Not relevant	2,8	3,7	3,6	Not relevant
Reducing cooling	2,9	2,9	3,1	Not relevant	2,6	3,0	3,0	Not relevant

Using low consumption light bulbs	3,4	3,4	4,0	Not relevant	3,3	3,3	3,8	Not relevant
Switching off stand by mode of electric appliances	2,6	2,7	3,0	Not relevant	2,3	2,8	2,8	Not relevant
Choosing energy efficient appliances	3,1	3,2	3,2	Not relevant	2,9	2,7	3,3	Not relevant
Making a shower in spite of a bath	2,8	2,8	3,1	Not relevant	2,6	2,9	3,1	Not relevant
Driving the car in a environmental friendly way	2,5	2,8	2,6	Not relevant	2,2	2,9	2,8	Not relevant
Moving by foot or bike whenever possible	3,3	3,6	3,1	Not relevant	2,5	3,4	3,1	Not relevant
Buying local food	2,5	2,9	2,3	Not relevant	2,4	2,5	2,7	Not relevant

Conclusion: Evaluation of technical students slightly decreased after using IUSES, while for business and scientific schools there are no relevant trends in the ante and post evaluation.

Business students gave higher evaluation to “lighting – switching off lights” and “using low consumption bulbs”.

1.3 Students energy behaviour

How do you go to school?	**Ex ante questionnaire %**	**Ex post questionnaire %**
By foot or bicycle	29,5%	29,5%
By public transport	69,8%	66,4%
By motorbike	1,6%	3,4%
By car	11,2%	17,1%

Using car sharing	7,4%	13,0%

Which of the following actions are you doing in your everyday life to save energy (you can choose more than one answer):	**Ex ante questionnaire %**	**Ex post questionnaire %**
Turning off light when I'm not in a room	82,9%	83,6%
Reducing heating	37,2%	33,6%
Switching off TV when nobody is watching it	66,3%	67,1%
Reducing cooling	20,5%	25,3%
Using low consumption light bulbs	54,3%	63,7%
Switching off stand by mode of electric appliances	27,5%	24,0%
Choosing energy efficient appliances	24,4%	28,1%
Making a shower in spite of a bath	54,3%	51,4%
Driving the car in a environmental friendly way	8,1%	15,8%
Moving by foot or bike whenever possible	51,9%	51,4%
Buying local food	39,5%	40,4%

There is a 5% increase in reducing cooling, a significant increase in choosing energy efficient appliances and a significant increase also in driving the car in a environmental friendly way. So we think the IUSES has got positive impact on students in these actions.

30,1% of the questioned students involved someone else in his/her energy saving actions. The total amount of people involved is 126.

Does age, gender or type of school have an impact on the answers provided?

Answers summarized by age: **Ex ante questionnaire average**

Age	15	16	17	18	19	20	21	22
Turning off light when nobody is in a room	100,0%	83,6%	81,8%	78,0%	90,5%	44,4%	50,0%	100,0%
Reducing heating	30,0%	35,6%	31,8%	36,0%	42,9%	77,8%	75,0%	100,0%
Switching off TV when nobody is watching it	66,7%	75,3%	69,7%	66,0%	47,6%	22,2%	25,0%	100,0%
Reducing cooling	26,7%	26,0%	16,7%	16,0%	14,3%	22,2%	25,0%	0,0%
Using low consumption light bulbs	70,0%	47,9%	48,5%	56,0%	57,1%	66,7%	75,0%	100,0%
Switching off stand by mode of electric appliances	43,3%	35,6%	16,7%	26,0%	28,6%	11,1%	25,0%	0,0%
Choosing energy efficient appliances	13,3%	26,0%	24,2%	24,0%	28,6%	33,3%	50,0%	0,0%
Making a shower in spite of a bath	60,0%	54,8%	57,6%	46,0%	52,4%	55,6%	50,0%	50,0%
Driving the car in a environmental friendly way	3,3%	5,5%	7,6%	10,0%	14,3%	22,2%	0,0%	0,0%
Moving by foot or bike whenever possible	76,7%	52,1%	39,4%	52,0%	52,4%	66,7%	50,0%	0,0%
Buying local food	40,0%	32,9%	47,0%	36,0%	47,6%	44,4%	50,0%	50,0%

Answers summarized by age: Ex post questionnaire average

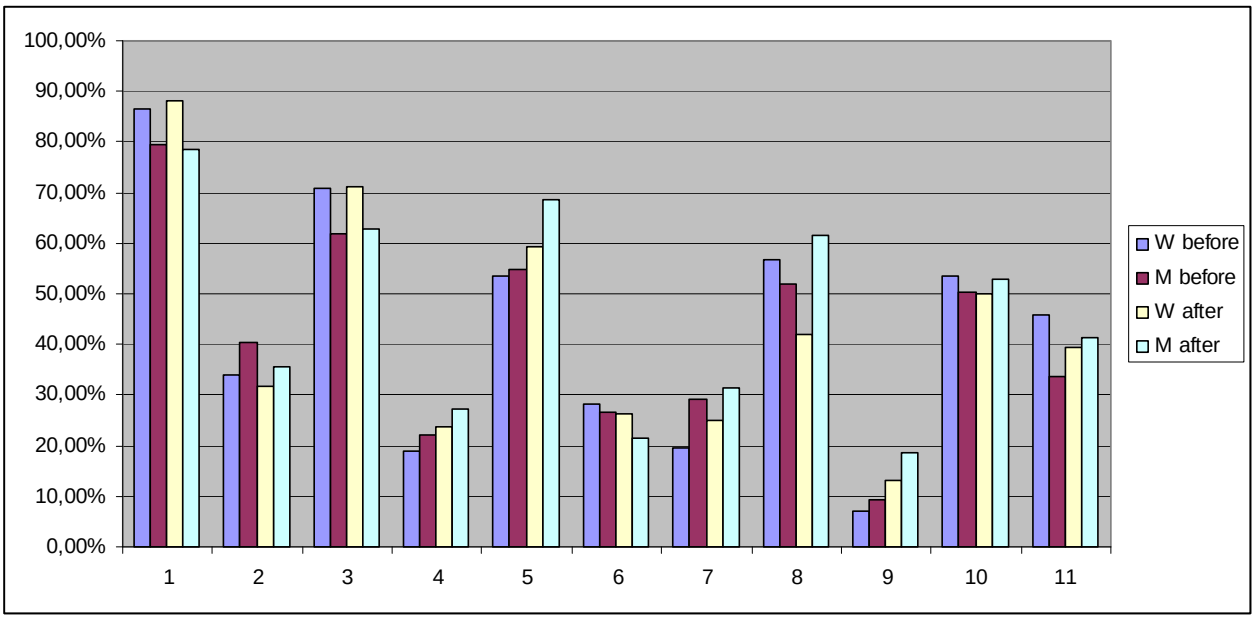
Age	15	16	17	18	19	20	21	22
Turning off light when nobody is in	100,0%	96,3%	79,6%	77,5%	81,3%	100,0%	66,7%	100,0%

a room								
Reducing heating	0,0%	25,9%	26,5%	45,0%	25,0%	42,9%	100,0%	100,0%
Switching off TV when nobody is watching it	66,7%	77,8%	71,4%	60,0%	56,3%	71,4%	33,3%	100,0%
Reducing cooling	33,3%	25,9%	28,6%	20,0%	18,8%	42,9%	33,3%	0,0%
Using low consumption light bulbs	100,0%	70,4%	51,0%	65,0%	68,8%	71,4%	100,0%	100,0%
Switching off stand by mode of electric appliances	0,0%	29,6%	24,5%	27,5%	6,3%	42,9%	0,0%	0,0%
Choosing energy efficient appliances	0,0%	33,3%	22,4%	27,5%	25,0%	71,4%	33,3%	0,0%
Making a shower in spite of a bath	100,0%	40,7%	42,9%	65,0%	56,3%	57,1%	33,3%	0,0%
Driving the car in a environmental friendly way	0,0%	29,6%	6,1%	17,5%	6,3%	42,9%	33,3%	0,0%
Moving by foot or bike whenever possible	66,7%	55,6%	46,9%	52,5%	43,8%	42,9%	100,0%	100,0%
Buying local food	33,3%	51,9%	36,7%	37,5%	37,5%	71,4%	0,0%	0,0%

After having used the IUSES toolkit, younger students of 15 and 16 years old, began to do more energy saving actions than older students. However the trend of changes in behaviour among older students is less relevant for the analysis because of the smaller number of questioned students.

Answers summarized by gender:

Gender	**Ex ante questionnaire average**		**Ex post questionnaire average**	
	W	M	W	M
Turning off light when nobody is in a room	86,6%	79,4%	88,2%	78,6%
Reducing heating	33,9%	40,5%	31,6%	35,7%
Switching off TV when nobody is watching it	70,9%	61,8%	71,1%	62,9%
Reducing cooling	18,9%	22,1%	23,7%	27,1%
Using low consumption light bulbs	53,5%	55,0%	59,2%	68,6%
Switching off stand by mode of electric appliances	28,3%	26,7%	26,3%	21,4%
Choosing energy efficient appliances	19,7%	29,0%	25,0%	31,4%
Making a shower in spite of a bath	56,7%	51,9%	42,1%	61,4%
Driving the car in a environmental friendly way	7,1%	9,2%	13,2%	18,6%
Moving by foot or bike whenever possible	53,5%	50,4%	50,0%	52,9%
Buying local food	45,7%	33,6%	39,5%	41,4%



Men started using low consumption light bulbs after IUSES.

There is a decrease in the use of the shower instead of the bath among women, on the contrary there is an increase among men.

Answers summarized by type of school:

Type of school	**Ex ante questionnaire average**				**Ex post questionnaire average**			
	technical	scientific	business	Linguistic /art	technical	scientific	business	Linguistic /art
Turning off light when nobody is in a room	75,3%	84,5%	88,7%	Not relevant	79,1%	77,3%	91,5%	Not relevant
Reducing heating	40,3%	32,7%	40,8%	Not relevant	41,9%	22,7%	35,6%	Not relevant
Switching off TV when nobody is watching it	57,1%	71,8%	67,6%	Not relevant	62,8%	72,7%	66,1%	Not relevant
Reducing cooling	23,4%	24,5%	11,3%	Not relevant	25,6%	36,4%	16,9%	Not relevant
Using low	49,4%	56,4%	56,3%	Not relevant	69,8%	54,5%	66,1%	Not

consumption light bulbs								relevant
Switching off stand by mode of electric appliances	26,0%	35,5%	16,9%	Not relevant	16,3%	29,5%	25,4%	Not relevant
Choosing energy efficient appliances	35,1%	23,6%	14,1%	Not relevant	39,5%	27,3%	20,3%	Not relevant
Making a shower in spite of a bath	51,9%	56,4%	53,5%	Not relevant	65,1%	36,4%	52,5%	Not relevant
Driving the car in a environmental friendly way	9,1%	8,2%	7,0%	Not relevant	14,0%	18,2%	15,3%	Not relevant
Moving by foot or bike whenever possible	58,4%	56,4%	38,0%	Not relevant	55,8%	50,0%	49,2%	Not relevant
Buying local food	35,1%	42,7%	39,4%	Not relevant	44,2%	38,6%	39,0%	Not relevant

Students of different types of schools started to do different kind of actions:

Students of technical schools started using low consumption light bulbs and having a shower instead of a bath.

Students of scientific schools started reducing cooling.

Students of business schools started using low consumption light bulbs and moving by foot or by bike whenever possible.

1.4 Students & IUSES

Please evaluate IUSES handbooks giving a score according to the following scale :1 (very poor), 2 (poor), 3 (fair), 4 (good) 5 (very good):	**Average**
Buildings handbook:	
Clearness	3,5
Usefulness of tips and hints for everyday life	3,3
Usefulness of contents for my future studies/job	2,9
Transport handbook:	
Clearness	3,4
Usefulness of tips and hints for everyday life	3,2
Usefulness of contents for my future studies/job	2,9
Industry handbook	
Clearness	3,3
Usefulness of contents for my future studies/job	3,0

Please indicate your agreement with the following statements (1 strongly disagree, 2 disagree, 3 neither agree nor disagree, 4 agree, 5 strongly agree):	**Average**
a) The IUSES experiments kit helped me in understanding the contents of the lessons.	2,8
b) The multimedia DVD helped me in understanding the contents of the lessons.	2,8

Where did you use the multimedia DVD?	**%**
At school	24%
At home	13%
At school and at home	19,9%

When the questioning started the DVD was not available, so only the 56,8% of students answered to the question about the use of the DVD.

The overall evaluation of the tool kit by the students was 2,8.

Age	15	**16**	**17**	**18**	19	20	21	22
IUSES e1periments kit helped me in understanding the contents of the lessons	2,3	2,9	2,7	2,8	2,7	3,0	3,3	0,0

Gender	**Average**
W	2,6
M	2,8

Type of school	
technical	2,9
scientific	2,6
business	2,7

2 Teachers feedback

2.1 Teachers details

General data about teachers: average age 48,9

gender (31,8 % of male, 68,2 % female)

Type of school	%
technical	45,5%
scientific	27,3%
business	22,7%
languages/art	4,5%

Which subject are you teaching:	%
Technology	22,7%
Biology, chemistry	50,0%
Physics	68,2%
Math	36,4%
Literature, history, philosophy	0,0%
Foreign language	9,1%
Art	0,0%
Other (specify)	45,5%

Other subjects: Geography, Marketing, Management, Ecology, Economy, Goods knowledge, Mechanics, Machine construction and operation, Renewable sources, Using of energy, Environment, Electricity, Basics of electro-technology, Electrotechnics, Machines, Electro-energy

Technical schools specialization: civil engineering (2), electrotechnics and mechanics (2),

2.2 Teaching Energy Efficiency using IUSES toolkit

Number of hours devoted to teaching energy efficiency: summary: 125, the average for each teacher is 6,25 hours.

Number of students trained using IUSES toolkit: 1784

Before using IUSES educational kit were you already teaching energy efficiency in your lessons?	**%**
No	22,7%
Yes, but in a smaller number of hours	54,5%
Yes, in the same number of hours	22,7%

Please indicate your agreement with the following statements (1 strongly disagree, 2 disagree, 3 neither agree nor disagree, 4 agree, 5 strongly agree)	**Average**
IUSES Teachers guidebook helps teachers in preparing their lessons	4,3
IUSES Teachers guidebook gives useful information in setting up an energy saving plan	4,3

One complained about formal mistakes and format of the text.

One teacher from business school complained that it took too much time to study handbooks, the books can be used only in the specific subject and in most schools it can be used only when they are really interested/focused in/on this area.

One teacher from school of civil engineering missed the theme focused on water sources.

One teacher from school of electro-mechanics would be grateful for updating in further years according to new technologies.

Two teachers complained about some mistakes in translation and some part of the text was not so clear in some points.

But generally teachers were satisfied with the handbooks.

Please evaluate IUSES handbooks giving a score according to the following scale :1 (very poor), 2 (poor), 3 (fair), 4 (good) 5 (very good):	**Average**
Buildings handbook:	
Clearness	4,2
Usefulness of tips and hints for everyday life	4,4
Usefulness of contents for my future studies/job	3,7
Transport handbook:	
Clearness	4,3
Usefulness of tips and hints for everyday life	4,3
Usefulness of contents for my future studies/job	3,9
Industry handbook	
Clearness	4,1
Usefulness of contents for my future studies/job	3,7

Please indicate your agreement with the following statements (1 strongly disagree, 2 disagree, 3 neither agree nor disagree, 4 agree, 5 strongly agree):	**Average**
IUSES experiments kit help students in understanding the contents of the lessons.	4,2
The multimedia DVD help students in understanding the contents of the lessons	4,0

How many teachers would suggest other teachers to use IUSES educational kit? 95,5% (21 of 22 questioned teachers). Only one reply no as she said that there would not be enough space in the schedule for extra curricula activities.

How many teachers are going to use IUSES educational toolkit next year? 100%

How many schools are going to implement energy saving plan? 31,8% (7 of 22 teachers).

One teacher said that he will not implement an energy saving plan however he is already arranging an ECO-conference at school every year, collecting useless electrical appliances and going to change the windows at school soon.

About energy saving plans:

1) One is doing measures for reducing heating costs and saving hot water at home

2) One is monitoring the energy saving after having changed the windows and monitored the switching off the lights, focusing on the households - to teach students that this is their money - they will learn how to safe energy, money at home and than in their jobs

3) One will use efficient lighting and will try to reduce electric appliances consumption

4) Some schools manifested the will to do an energy saving plan, but they have not decided yet the theme to focus on

5) Another school is under construction and they will try to respect energy saving measures in the new building

Is the type of school, subjects taught, age or gender of teachers influencing the answers provided by teachers?

Type of school

Please evaluate IUSES handbooks giving a score according to the following scale :1 (very poor), 2 (poor), 3 (fair), 4 (good) 5 (very good):	**technical**	**scientific**	**business**	**linguistic/art**
Buildings handbook:				
Clearness	3,8	4,4	4,3	4,0
Usefulness of tips and hints for everyday life	4,0	4,4	4,4	4,1
Usefulness of contents for my future studies/job	3,8	4,1	3,6	3,1
Transport handbook:				
Clearness	3,2	4,3	4,1	4,0
Usefulness of tips and hints for everyday life	3,8	4,2	4,1	4,1
Usefulness of contents for my future studies/job	4,0	4,2	3,7	3,5
Industry handbook				
Clearness	3,8	3,8	4,2	3,9
Usefulness of contents for my future studies/job	3,8	4,1	3,7	3,4

Teachers from scientific and business schools have an higher opinion about the handbooks than the technical and linguistic schools.

Age

Please evaluate IUSES handbooks giving a score according to the following scale :1 (very poor), 2 (poor), 3 (fair), 4 (good) 5 (very good):	**20-30**	**30-40**	**40-50**	**50-60**	**60-70**
Buildings handbook:					
Clearness	5,0	4,2	4,0	4,0	6,3
Usefulness of tips and hints for everyday life	5,0	4,3	4,0	4,4	5,7
Usefulness of contents for my future studies/job	4,0	3,7	2,5	3,8	5,7
Transport handbook:					
Clearness	5,0	4,3	3,5	3,7	5,0
Usefulness of tips and hints for everyday life	5,0	4,3	4,0	4,1	4,7
Usefulness of contents for my future studies/job	4,0	3,8	3,0	3,9	4,7
Industry handbook					
Clearness	0,0	4,0	3,5	4,1	6,0
Usefulness of contents for my future studies/job	4,0	3,7	3,0	3,8	5,3

Middle age teachers (40 years old) have a lower opinion about the handbooks.

Gender

Please evaluate IUSES handbooks giving a score according to the following scale :1 (very poor), 2 (poor), 3 (fair), 4 (good) 5 (very good):	**W**	**M**
Buildings handbook:		
Clearness	4,3	4,1
Usefulness of tips and hints for everyday life	4,5	4,1
Usefulness of contents for my future studies/job	3,8	3,6
Transport handbook:		
Clearness	4,1	3,6
Usefulness of tips and hints for everyday life	4,1	4,1
Usefulness of contents for my future studies/job	3,7	3,7
Industry handbook		
Clearness	3,9	4,0
Usefulness of contents for my future studies/job	3,7	3,7

Women in general have a higher opinion about the handbooks.

2.3 Teachers behaviour

Going to school:	**A year ago (%)**	**After using IUSES toolkit**
By foot or bicycle	31,8%	36,4%
By public transport	63,6%	59,1%
By motorbike	4,5%	4,5%
By car	27,3%	22,7%
By car sharing	9,1%	22,7%

Which of the following actions have you begun to do after teaching energy efficiency in your everyday life to save energy (multiple answer possible):	**%**
Turning off light when I'm not in a room	63,6%
Reducing heating	50,0%
Switching off TV when nobody is watching it	50,0%
Reducing cooling	9,1%
Using low consumption light bulbs	50,0%
Switching off stand by mode of electric appliances	40,9%
Choosing energy efficient appliances	45,5%
Making a shower in spite of a bath	40,9%
Driving the car in a environmental friendly way	22,7%
Moving by foot or bike whenever possible	36,4%
Buying local food	27,3%

Are teachers behaviours energy efficient? Yes

Did the IUSES project have an impact on teachers behaviour? Yes

Most of the teachers focused their attention on small actions of the every day life. 72,7% started to do more than 4 of 11 actions.

3 Conclusions

Compare teachers and students answers? Are they coherent? Is any significant difference?

Please evaluate IUSES handbooks giving a score according to the following scale :1 (very poor), 2 (poor), 3 (fair), 4 (good) 5 (very good):	**Teachers**	**Students**
Buildings handbook:		
Clearness	4,2	3,5
Usefulness of tips and hints for everyday life	4,4	3,3
Usefulness of contents for my future studies/job	3,7	2,9
Transport handbook:		
Clearness	4,3	3,4
Usefulness of tips and hints for everyday life	4,3	3,2
Usefulness of contents for my future studies/job	3,9	2,9
Industry handbook		
Clearness	4,1	3,3
Usefulness of contents for my future studies/job	3,7	3,0

There is a significant difference. Teachers have a higher opinion about the handbooks than students.

Going to school:	**Students (after using IUSES)**	**Teachers (after teaching IUSES)**
By foot or bicycle	29,5%	36,4%
By public transport	66,4%	59,1%
By motorbike	3,4%	4,5%
By car	17,1%	22,7%
By car sharing	13,0%	22,7%

What's the lesson learnt?

During our interaction with teachers and students we found out that the interest in energy saving topics is high, especially if related to the daily life activities. Teachers have really appreciated the handbooks, the tool kit and the training course. From their observation it was obvious that there is a lack of time and resources to dedicate more time to this topic. Furthermore, in Czech schools curricula including energy saving are usually with some exceptions in technical schools. Anyway the level and the quality of the information given to students depend on teachers motivation and ability. The need to have more information about this issue is evident but, because of the lack of time, most of teachers risk to lose the occasion to get this opportunity for their students and for them.

What worked best?

The handbooks obtained the biggest success. All of them were highly evaluated by teachers as they allowed them to choose specific and systematic explanations on energy savings among the . Also the toolkit was found very interesting for the teachers, even if for technical schools was easier to use than for the other schools.

What should be improved?

The planning of the European Energy Saving Award would have required more time. A lot of time was needed to persuade schools and students to participate to the EESA and after this phase there was little time to prepare the projects and obtain good results in the competition.

Report on testing activities in FRANCE

Prioriterre

Author: Anne-Sophie Masure

Introduction
The IUSES handbooks have been considered very useful by French teachers. Before their participation to the IUSES project, teachers had a very few indications and data to use about energy efficiency and saving.
Lot of teachers were eager to discover the manuals and the toolkit and to have free documentation tool.
Seven schools were involved and 27 teachers have taken part to the IUSES training, around 31 have taken part to the project.
Teachers attended the training modules and received the manual in February 2010 as the content and layout were delayed to January 2010. A complementary training was organised in January for the teachers in needs.

Number of filled in questionnaires by students:
=>ante questionnaire: 91
=>post questionnaire: 91

Number of filled in questionnaires by teachers:
The different questionnaires were sent to 18 contact teachers. We received some answers on the first month of testing and the others at the beginning of June.
All teachers have used the toolkit except for 3 teachers who said that they did not have the necessary time to use the handbook during this school year but they will use the manuals next year.

Only one school sent us the feedback from the students. Phone calls were made upon which we could join only 4 teachers. In order to motivate them, 4 e-mails of reminding for the questionnaire has been sent but only 10 teachers had time to answer.

The little time available for teachers to use the handbooks had some consequences also on the students. The time was not sufficient to measure the differences on students' behaviour before and after the participation to IUSES. Moreover, as June is a period of exams in all level of school, some teachers didn't ask them to fill the questionnaires.

Timeframe in which testing occurred :
The manuals were received at the end of January and distributed on February. The testing phase started at the beginning of March and ended in June.

Any other remarks about the framework in which the testing occurred:
Because of school holydays and Easter holidays, the testing phase in France lasted only two months. In our Region there were school holidays from the 13th of February till the 1st of March, and Easter holydays from 10th to 26th of April.

1 Students feedback

1.1 Students details

Age	%
13	5
14	15
15	25
16	25
17	20
18	
Average age	15

Gender	%
Male	48
Female	52

Type of school	%
General	50
Technical	25
scientific	25
business	
languages/art	

1.2 Perception of energy consumption

What's the contribution of each of the following actions in saving energy (1 very low, 2 low, 3 fair, 4 high, 5 very high)		
	Ex ante questionnaire average	Ex post questionnaire average
Turning off light when nobody is in a room	5	5

Reducing heating	1	4
Switching off TV when nobody is watching it	4	5
Reducing cooling		
Using low consumption light bulbs	3	5
Switching off stand by mode of electric appliances	3	5
Choosing energy efficient appliances	1	3
Making a shower in spite of a bath	3	4
Driving the car in a environmental friendly way	1	
Moving by foot or bike whenever possible	4	4
Buying local food	1	3

Remarks

If the class section is of a scientific type, we can notice that more experimentations have been made.

The toolkit was funnier for the youngest students (13-14 years old). For elder students the experiments were in some cases too simple. The CD was received later and it was distributed to all the students by the teachers.

For classes with a general educational programme, which are the majority in France (students from 13 to 16 years old), the material was more difficult than for technical schools but it could be taught in every class anyway.

1.3 Students energy behaviour

How do you go to school?	**Ex ante questionnaire %**	**Ex post questionnaire %**
By foot or bicycle	40	45
By public transport	20	20
By motorbike	5	5
By car	40	35

Using car sharing	5	5

Remarks

The different percentages depend also from the area where students live (mountains, city centres, countryside) and if several students live in the same area.

Which of the following actions are you doing in your everyday life to save energy (you can choose more than one answer):	**Ex ante questionnaire %**	**Ex post questionnaire %**
Turning off light when I'm not in a room	87	95
Reducing heating	1	Summer time!! So not heating at this period
Switching off TV when nobody is watching it	78	85
Reducing cooling	-	-
Using low consumption light bulbs	0	2
Switching off stand by mode of electric appliances	3	10
Choosing energy efficient appliances	0	-
Making a shower in spite of a bath	1	5
Driving the car in a environmental friendly way	-	-
Moving by foot or bike whenever possible	0	-
Buying local food	0	-

Remarks

Students' answers also depend on the situation of their schools. Some colleges are located in the city centres and others in the periphery or in the countryside.

Young people cannot drive before 18 years old in France, so students under 18 years old could not answer to the question about “driving a car in an environmental friendly way”.

1.4 Students & IUSES

Please evaluate IUSES handbooks giving a score according to the following scale :1 (very poor), 2 (poor), 3 (fair), 4 (good) 5 (very good):	**Average**
Buildings handbook:	
Clearness	4
Usefulness of tips and hints for everyday life	4
Usefulness of contents for my future studies/job	
Transport handbook:	
Clearness	3
Usefulness of tips and hints for everyday life	4
Usefulness of contents for my future studies/job	
Industry handbook	
Clearness	3
Usefulness of contents for my future studies/job	

Please indicate your agreement with the following statements (1 strongly disagree, 2 disagree, 3 neither agree nor disagree, 4 agree, 5 strongly agree):	**Average**

a) The IUSES experiments kit helped me in understanding the contents of the lessons.	3
b) The multimedia DVD helped me in understanding the contents of the lessons.	

2 Teachers feedback

2.1 Teachers details

General data about teachers:

Age: 60% senior teacher, 40% junior

Gender: 50% male, 50% female

Type of school	**%**
technical	40
scientific	30
business	0
general	30
languages/art	

Which subject taught:	**%**
Technology	40
Biology, chemistry	18
Physics	30
Math	10
Literature, history, philosophy	2

Foreign language	
Art	
Other (specify)	

2.2 Teaching Energy Efficiency using IUSES toolkit

Number of hours devoted to teaching energy efficiency: from 4 to 8 hours per classes during the 4 months of testing

Number of students trained using IUSES toolkit: an average of 40 classes among the teachers that have answered (10). It means 1200 students involved in 4 month. These data could be doubled if we give an estimation of the answer from the 8 other teachers.

4 teachers affirmed they did not have time to use the handbooks this school year but will do it next year. Nevertheless they have used the experimental kit and the DVD.

Before using IUSES educational kit were you already teaching energy efficiency in your lessons?	**%**
No	80
Yes, but in a smaller number of hours	10
Yes, in the same number of hours	10

Please indicate your agreement with the following statements (1 strongly disagree, 2 disagree, 3 neither agree nor disagree, 4 agree, 5 strongly agree)	**Average**
IUSES Teachers guidebook helps teachers in preparing their lessons	4
IUSES Teachers guidebook gives useful information in setting up an energy saving plan	4

Remarks

The “teacher handbook” was well-structured with examples, exercises and experiments.

Please evaluate IUSES handbooks giving a score according to the following scale :1 (very poor), 2 (poor), 3 (fair), 4 (good) 5 (very good):	**Average**
Buildings handbook:	
Clearness	3
Usefulness of tips and hints for everyday life	3
Usefulness of contents for my future studies/job	3
Transport handbook:	
Clearness	4
Usefulness of tips and hints for everyday life	3
Usefulness of contents for my future studies/job	3
Industry handbook	
Clearness	4
Usefulness of contents for my future studies/job	3

Remarks

=>Teachers would like to have a stronger participation with the national educational system. The State requires to teach about energy efficiency topics but data and means of teaching are missing. These manuals are very helpful but may need adaptation to their need. Which they can also do themselves wit the manuals!)

=>The teachers’ guidebook is very rich and it could have a “real pedagogical sequence” in order to specify what teachers can use in each type of school

=> Teachers would like to show them the link between the subject taught at schools and the manuals, for example indicating in the teacher manual: to teach energy efficiency in building and have a method of calculation go to section “s”

=>Manuals sometimes were too difficult for 12-13 years old students.

Please indicate your agreement with the following statements (1 strongly disagree, 2 disagree, 3 neither agree nor disagree, 4 agree, 5 strongly agree):	**Average**
IUSES experiments kit help students in understanding the contents of the lessons.	4
The multimedia DVD help students in understanding the contents of the lessons	3

Where did the students use the multimedia DVD?	**%**
At school	/
At home	/
At school and at home	/

Remarks

=> Some teachers thought that most of the experiences in the kit are quite simple for high schools students (15-18 years old).

=> One ‘technology teacher’ complained that the toolkit was too simple and not enough innovative(for example he would like to have other isolating materials to compare with)**How many teachers are going to use IUSES educational toolkit next year?**

⇨ around 70%

How many schools are going to implement energy saving plan? Summarize briefly details

=> 70%

Schools are implementing different ideas:

-Plan of gas and electricity saving (trough behavioural changes and material changes)

-Put some LED lamps in one class and see the real energy and money saving and successively put LED lamps in every classroom

-Energy audit (the local government helps them in financing the audit)

-Timer in toilets rooms

-Energy saver bulbs in all classes

-Eco-representatives among students to organise sustainable actions

The type of school, age or gender does not seem to have some influences on . But timing is influencing them in teaching the subject

2.3 Teachers behaviour

Going to school:	**A year ago (%)**	**After using IUSES toolkit**
By foot or bicycle	5	10
By public transport	5	5
By motorbike	15	15
By car	50	45
By car sharing	25	25

Which of the following actions have you begun to do after teaching energy efficiency in your everyday life to save energy (multiple answer possible):	**%**
Turning off light when I'm not in a room	20
Reducing heating	5
Switching off TV when nobody is watching it	15

Reducing cooling	-
Using low consumption light bulbs	5
Switching off stand by mode of electric appliances	20
Choosing energy efficient appliances	5
Making a shower in spite of a bath	10
Driving the car in a environmental friendly way	10
Moving by foot or bike whenever possible	15
Buying local food	10

Is teachers behaviour energy efficient?

Teachers' behaviours are quite energy efficient considering that they live in different area and so the transportation issue is not the same.

Did IUSES have an impact on their behaviour?

Lot of teachers already did some efforts before using the IUSES handbooks.

3 Conclusions

What's the lesson learnt?

- ⇨ The manual fit more to students from 15 to 18 year old than to younger students

What worked best?

Manuals worked well. The presentation was very compact and tough for students.

Experimental kits were too simple for 16-18 year-old students, on the contrary they were very demonstrative for 13-14 year-old students.

What should be improved?

- ⇨ The presentation of the different section and paragraph
- ⇨ Have more space between the paragraph and chapter like usual school manual
- ⇨ The experimental kit could be an introduction for the youngest classes to the use of the manuals in the higher classes. The higher classes more complex experimental kits would be recommended. Technology teachers told us that the experimental kit was not so new to technology classes.

⇨ The main difficulties were represented by the time schedule of the teachers and of the project. The testing of the handbooks and the kit was considered very interesting but they had very few time to answer to the questionnaires.

Report on testing activities in GREECE

CERTH

Author: Dimitri Sanopulos
Alexandros Iakovidis

0 Introduction

The first series of questionnaires was distributed electronically on Monday 29/3/10. The questionnaires were sent to 10 schools participating to the EESA. Five schools are from the Thessaloniki region and 5 from other Greek regions. The number of questionnaires collected is:

- Teachers Questionnaires: 12
- Students Questionnaires: 39

Subsequently the answers were grouped and sent to the project coordinator.
The second part of the survey was conducted in the period between 19/4/10 and 30/4/10. The same schools were contacted again and they were asked to disseminate the second questionnaire. The target was only students and 38 questionnaires were filled in and sent back to CERTH.

During the first part of the survey, some delays occurred due to Easter holidays, as schools did not have enough time to disseminate the questionnaires to students. Nevertheless, due to the smooth collaboration with the participating schools, teachers did their best and gathered the questionnaires in a very short period of time.

1 Students feedback

1.1 Students details

Questionnaire - Ante				Questionnaire - Post		
Age	**No**	**%**		**Age**	**No**	**%**
12	0	0,00%		12	0	0,00%
13	10	25,64%		13	4	10,53%
14	12	30,77%		14	9	23,68%
15	6	15,38%		15	18	47,37%
16	9	23,08%		16	7	18,42%
17	2	5,13%		17	0	0,00%
Average	15 years old (14,89)			Average	15 years old (14,74)	

Questionnaire - Ante				Questionnaire - Post		
Gender	**No**	**%**		**Age**	**No**	**%**
Male	17	43,59%		Male	14	36,84%
Female	22	56,41%		Female	24	63,16%

Questionnaire - Ante				Questionnaire - Post		
Type of School	**No**	**%**		**Type of School**	**No**	**%**
General	32	82,05%		General	36	94,74%
Technical	7	17,95%		Technical	2	5,26%
Musical/art	0	0,00%		Musical/art	0	0,00%
Special	0	0,00%		Special	0	0,00%

1.2 Perception of energy consumption

What's the contribution of each of the following actions in saving energy (1 very low, 2 low, 3 fair, 4 high, 5 very high)		
	Ex ante questionnaire average	**Ex post questionnaire average**
Turning off light when nobody is in a room	3,94	3,68
Reducing heating	2,46	3,58
Switching off TV when nobody is watching it	3,82	3,68
Reducing cooling	2,41	3,42
Using low consumption light bulbs	4,15	3,00
Switching off standby mode of electric appliances	2,95	3,05
Choosing energy efficient appliances	3,56	3,84
Making a shower in spite of a bath	3,23	3,53
Driving the car in a environmental friendly way	1,69	3,42
Moving by foot or bike whenever possible	3,72	3,47
Buying local food	1,64	2,79

1.3 Students energy behaviour

How do you go to school?	Ex ante questionnaire %	Ex post questionnaire %
By foot or bicycle	64,10%	42,11%
By public transport	23,08%	23,68%
By motorbike	10,26%	5,26%
By car	20,51%	5,26%
Using car sharing	10,26%	23,68%

The answers to the above questions may have been influenced by some factors, for example the location of the schools. Half of questionnaires come from Thessaloniki where usually students lives close to school and walking is usually the best option to go to school. In smaller cities instead students need to select alternative options for going to school.
Secondly, when the second part of the survey was conducted, a significant increase of gas price occurred. Therefore, it is easily understandable that travellers were particularly motivated to look for different transportation methods. Whether was not possible to avoid the use of the car, car sharing has been significantly practiced.

Which of the following actions are you doing in your everyday life to save energy (you can choose more than one answer):	Ex ante questionnaire %	Ex post questionnaire %
Turning off the light when you are not in a room	82,05%	81,58%
Reducing heating	25,64%	60,53%
Switching off TV when nobody is watching it	69,23%	60,53%
Reducing cooling	23,08%	47,37%
Using low consumption light bulbs	84,62%	86,84%
Switching off stand by mode of electric appliances	56,41%	55,26%
Choosing energy efficient appliances	64,10%	65,79%
Making a shower in spite of a bath	56,41%	57,89%
Driving the car in a environmental friendly way	25,64%	60,53%

Moving by foot or bike whenever possible	61,54%	76,32%
Buying local food	12,82%	10,53%

1.4 Students & IUSES

Please evaluate IUSES handbooks giving a score according to the following scale :1 (very poor), 2 (poor), 3 (fair), 4 (good) 5 (very good):	**Average**	**Total Average**
Buildings handbook:		
Clearness	3,79	**3,79**
Usefulness of tips and hints for everyday life	3,58	
Usefulness of contents for my future studies/job	4,00	
Transport handbook:		
Clearness	4,13	**4,04**
Usefulness of tips and hints for everyday life	3,95	
Usefulness of contents for my future studies/job	4,03	
Industry handbook		
Clearness	3,79	**3,95**
Usefulness of contents for my future studies/job	4,11	

Please indicate your agreement with the following statements (1 strongly disagree, 2 disagree, 3 neither agree nor disagree, 4 agree, 5 strongly agree):	**Average**
a) The IUSES experiments kit helped me in understanding the contents of the lessons.	4,21
b) The multimedia DVD helped me in understanding the contents of the lessons.	0,00

2 Teachers feedback (Total questionnaires received: 12)

2.1 Teachers details

Teachers Questionnaire						
Demographics						
Age	**No**	%		**Gender**	**No**	%
30 - 39	6	50,00%		Male	9	75,00%
40 - 49	3	25,00%		Female	3	25,00%
50 - 59	3	25,00%				

Even if the 50% of the teachers involved are young, only one teacher dealt with this subject for the first time. Therefore our sample could be characterized as 'experienced teachers'.

Teachers Questionnaire		
Type of School	**No**	**%**
General	11	91,67%
Technical	1	8,33%

Which subject are you teaching (including from question 6):	**No**	**%**
Technology	7	28,00%
Physics	4	16,00%
Math	7	28,00%
Literature, history, philosophy	7	28,00%

2.2 Teaching Energy Efficiency using IUSES toolkit

Number of hours devoted to teaching energy efficiency: 9 teachers answered that they taught 2 hours/week and 3 teachers 3 hours/week

Number of students trained using IUSES toolkit: 359

Before using IUSES educational kit were you already teaching energy efficiency in your lessons?	**No**	**%**
No	1	8,33%
Yes, but in a smaller number of hours	4	33,33%
Yes, in the same number of hours	7	58,33%

Please indicate your agreement with the following statements (1 strongly disagree, 2 disagree, 3 neither agree nor disagree, 4 agree, 5 strongly agree)	**Average**
IUSES Teachers guidebook helps teachers in preparing their lessons	3,50
IUSES Teachers guidebook gives useful information in setting up an energy saving plan	4,33

Please evaluate IUSES handbooks giving a score according to the following scale :1 (very poor), 2 (poor), 3 (fair), 4 (good) 5 (very good):	**Average**	**Total Average**
Buildings handbook:		
Clearness	3,75	**4,00**
Usefulness of tips and hints for everyday life	4,33	
Usefulness of contents for my future studies/job	3,92	
Transport handbook:		
Clearness	3,75	**3,94**
Usefulness of tips and hints for everyday life	4,5	
Usefulness of contents for my future studies/job	3,58	
Industry handbook		
Clearness	3,66	**3,66**
Usefulness of contents for my future studies/job	3,66	

Please indicate your agreement with the following statements (1 strongly disagree, 2 disagree, 3 neither agree nor disagree, 4 agree, 5 strongly agree):	**Average**
a) The IUSES experiments kit helped me in understanding the contents of the lessons.	4,75

2.3 Teachers behaviour

Teachers Questionnaire		
Going to school:	A year ago (%)	After using IUSES toolkit %
By foot or bicycle	16,67%	16,67%
By car	58,33%	50,00%
By car sharing	25,00%	33,33%

Which of the following actions have you begun to do after teaching energy efficiency in your everyday life to save energy (multiple answer possible):	**%**
Turning off light when I'm not in a room	100,00%
Reducing heating	8,33%
Switching off TV when nobody is watching it	83,33%
Reducing cooling	41,67%
Using low consumption light bulbs	100,00%
Switching off stand by mode of electric appliances	58,33%
Choosing energy efficient appliances	75,00%
Making a shower in spite of a bath	41,67%
Driving the car in an environmental friendly way	66,67%
Moving by foot or bike whenever possible	66,67%

Even if the sample is quite small the teachers that took part in the survey seemed to strongly support the IUSES tool kit, as they gave an above-average grade in every criterion of evaluation.

The participants to the survey were already quite experienced in teaching energy efficiency, topics and this explains their answers to question n.10[2]. While the score in the first part of the question

[2] Question 10: Please indicate your agreement with the following statements (1 strongly disagree, 2 disagree, 3 neither agree nor disagree, 4 agree, 5 strongly agree)

(IUSES helps to prepare the lessons) is less satisfying compared to the average, in the second part students highly appreciated the information provided by the handbooks regarding an energy efficiency plan. The contents was considered as innovative compared to previous educational handbooks they have used before.

3 Conclusions

The general perception about IUSES trend was collected not only by the questionnaires but also by contacting personally the teachers involved in the project. Generally, IUSES was warmly accepted by schools. The experimental kit could be considered as the most attractive and influential part of the whole educational kit. Even if the CD was not at the disposal of the schools during the survey, the experimental kit received high marks both from students and teachers.
A deep reflection was done about the clearness of the contents of all the handbooks. The only discrepancy concerns the “transport handbook” which students marked with 4,13. Except from this, both students and teachers marked the clearness of the handbooks with high grades. In general, the “transport handbook” received the highest mark both from students and teachers, while the least was awarded to the “industry handbook”, considered less appealing than the other handbooks.

IUSES
Contract number:IEE/07/828/SI2.499427

Report on testing activities in IRELAND

Clean Technology Centre - Cork Institute of Technology

Author: Tadhg Coakley
Noel Duffy

0 Introduction

The testing of the IUSES material was carried out in Secondary Schools in Ireland from November 2009 to May 2010. It was done by teachers who had been trained in advance by the Clean Technology Centre, on the handbooks, DVDs and the Experimental Kit.

Testing was done with students in the Transition Year of 2nd level in Irish Schools (4th or 5th year), in between junior and senior cycles, for mainly 16 year old students. In this year students take a break from the very formal and rigid examination curricula and it is the only option for the teaching of non-curriculum materials such as those from IUSES.

23 teachers were involved in IUSES and received training, from 20 schools from all over Ireland. Overall, about 400 students were taught using the IUSES materials and 117 questionnaires were completed and returned to the Clean Technology Centre reporting results. Of these, 86 were completed before the training was carried out and 31 afterwards. However, further qualitative feedback was also received from teachers on their experiences with comments and suggestions, using the online blog and discussion forum set up by the Clean Technology Centre for that purpose.

The results of the various feedbacks are as follows:

1 Students feedback

1.1 Students details

Age	**%**
15	13
16	81
17	3
18	0
19	1.5
Not Known	1.5
Average age	15.9

Gender	**%**
Male	45
Female	55

Types of Schools: in Ireland almost all different subjects are taught in Secondary schools, including technical, scientific, business, humanities etc. Students do not specialise in one subject or another until third level.

1.2 Perception of energy consumption

What's the contribution of each of the following actions in saving energy (1 very low, 2 low, 3 fair, 4 high, 5 very high)		
	Ex ante questionnaire average	**Ex post questionnaire average**
Turning off light when nobody is in a room	4.1	3.8
Reducing heating	3.5	4.1
Switching off TV when nobody is watching it	3.7	3.6
Reducing cooling	2.7	3.0
Using low consumption light bulbs	3.7	4.0
Switching off stand by mode of electric appliances	3.6	3.3
Choosing energy efficient appliances	3.6	4.0
Making a shower in spite of a bath	3.9	4.0
Driving the car in a environmental friendly way	3.1	3.4
Moving by foot or bike whenever possible	4.1	4.4
Buying local food	3.1	3.6

It appears that in almost all cases the energy issues have a higher importance rating after the training but is not apparent a greater comparative understanding of the most important issues. Those issues that may directly apply to the students themselves (such as turning off a light) rather than those that do not (such as driving) appear to have a higher relevance, which is understandable.

Age, gender or type and types of school have no impact on the provided answers.

1.3 Students energy behaviour

How do you go to school?	Ex ante questionnaire %	Ex post questionnaire %
By foot or bicycle	37.2	22.5
By public transport	12.7	9.6
By motorbike	1.1	9.6
By car	39.5	41.9
Using car sharing	9.3	19.3

Which of the following actions are you doing in your everyday life to save energy (you can choose more than one answer):	Ex ante questionnaire %	Ex post questionnaire %
Turning off light when I'm not in a room	90.6	93.5
Reducing heating	24.4	25.8
Switching off TV when nobody is watching it	84.8	87.0
Reducing cooling	18.6	16.1
Using low consumption light bulbs	48.8	64.5
Switching off stand by mode of electric appliances	48.8	64.5
Choosing energy efficient appliances	20.9	32.2
Making a shower in spite of a bath	74.4	70.9
Driving the car in a environmental friendly way	16.2	22.5
Moving by foot or bike whenever possible	76.7	67.7
Buying local food	44.1	29.0

With regard to transport options to and from schools, it is clear from an analysis of the answers that the walking/cycling and public transport options are most common for city schools where there is a large population close to the school. Car is the most favoured for rural schools, and the most popular overall (though with some sharing). The choice of transport is usually outside the scope of the student to choose.

With regard to the actions of the students, seven of the options show an increase in more environmentally friendly behaviour after the training and four show the opposite. In Ireland "cooling" is not commonly used, however heating is required.

Driving is not an option for 16 year old students. The four highest percentage options are those that related directly to students themselves, such as turning off the light and TV, having a shower instead of a bath and using the bike or walking.

For the most part the students acted alone except in cases where their families were also involved.

Age, gender or type and types of school have no impact on the provided answers.

1.4 Students & IUSES

Please evaluate IUSES handbooks giving a score according to the following scale :1 (very poor), 2 (poor), 3 (fair), 4 (good) 5 (very good):	**Average**
Buildings handbook:	
Clearness	4.2
Usefulness of tips and hints for everyday life	3.7
Usefulness of contents for my future studies/job	3.8
Transport handbook:	
Clearness	4
Usefulness of tips and hints for everyday life	4
Usefulness of contents for my future studies/job	3.8

Industry handbook	
Clearness	4
Usefulness of contents for my future studies/job	3.7

Please indicate your agreement with the following statements (1 strongly disagree, 2 disagree, 3 neither agree nor disagree, 4 agree, 5 strongly agree):	**Average**
a) The IUSES experiments kit helped me in understanding the contents of the lessons.	4
b) The multimedia DVD helped me in understanding the contents of the lessons.	3.5

Where did you use the multimedia DVD?	**%**
At school	93
At home	0
At school and at home	7

Overall there was a positive evaluation of the handbooks by the students, with most values about of about 4 out of 5 (good). There was little preference between manuals with all having similar scores.

In general, and this includes teacher feedback, the content was found not specific to the national context and school system.

Age, gender or type and types of school have no impact on the provided answers.

2 Teachers feedback

2.1 Teachers details

Teachers were between about 28 and 55 in age and were mainly focused on transition year students (16 years). Mainly science oriented. 11 of the 23 teachers were male and 12 were female so it was almost a 50/50 spread. The teachers involved were mainly science oriented but also included geography and building.

Only a few teachers completed the questionnaire. Feedback was received, however, using a blog/discussion forum and an overview of this is given below. The information from the blog/discussion forum was more qualitative than quantitative.

The teachers used the handbooks and kits with Transition Year students whose time is very limited so that they could not spend as much time as they would have liked with the piloting. Usually they took the students in groups of about 20 and then broke them up further for the experiments.

In Ireland almost all different subjects are taught in Secondary schools, including technical, scientific, business, humanities etc. Students do not specialise in one subject or another until third level. The teachers involved were mainly science oriented but also included geography and building.

2.2 Teaching Energy Efficiency using IUSES toolkit

While we have no hard data regarding percentages, teachers indicated to us that the materials provided meant that energy related teaching has already and will continue to increase significantly in their schools. Very little material relating to this subject is available in the general curriculum teaching materials and so the IUSES material has now filled that gap.

Please indicate your agreement with the following statements (1 strongly disagree, 2 disagree, 3 neither agree nor disagree, 4 agree, 5 strongly agree)	**Average**
IUSES Teachers guidebook helps teachers in preparing their lessons	4.6
IUSES Teachers guidebook gives useful information in setting up an energy saving plan	4.2

Teachers were positive about the guidebooks overall.

Please evaluate IUSES handbooks giving a score according to the following scale :1 (very poor), 2 (poor), 3 (fair), 4 (good) 5 (very good):	**Average**
Buildings handbook:	
Clearness	4.2
Usefulness of tips and hints for everyday life	3.4
Usefulness of contents for my future studies/job	3
Transport handbook:	
Clearness	3.6
Usefulness of tips and hints for everyday life	3
Usefulness of contents for my future studies/job	1
Industry handbook	
Clearness	3.6
Usefulness of contents for my future studies/job	1

Teachers were fairly happy with the layout and clearness. Some observations were made about the content requirements of the different teachers, geography teachers for example would like different contents from physics teachers. However they are conscious that it would not be possible to create manuals to suit all their needs. Overall the “buildings handbook” was the most popular and relevant and there were 4 building related teachers in the group and it fitted their needs perfectly.

From the feedback it was clear that the teachers took only some information from the handbooks and did not use them from start to finish as there was not enough time for that.

Please indicate your agreement with the following statements (1 strongly disagree, 2 disagree, 3 neither agree nor disagree, 4 agree, 5 strongly agree):	**Average**
IUSES experiments kit help students in understanding the contents of the lessons.	4

Teachers were very happy with the kit and most cited this as the reason they agreed to attend the training. If possible, they would have liked more copies of the kit for use (things tend to break and students can be careless). The wind turbine was difficult to get working, but those that did found it excellent. The solar panels were very successful especially those that were attached to the makeshift cars – however sunlight is necessary for these and not always available in Ireland. The energy meter was very popular and the teachers felt that this was a very successful pedagogical tool.

All the teachers said they would recommend the kit and they will use it again. At present no teachers are going to implement and energy plan but this may be done in the future or by other teachers. Gender, type of school, age etc. are not an issue, however the interest the teacher has in the subject is clearly increased. The more scientific teachers used the kit more and the building teachers found the insulation and the heating elements very worthwhile.

3 Conclusions

If possible the contents and the subjects should be as local and specific as possible. Tying in the information with the curriculum works best and the content should be divided into class (40 minute) chunks.

Generally teachers are currently stressed, under severe pressure to fulfil objectives and for this reason not very interested in new topics and issues. Pay levels have been cut in Ireland and many teachers are not motivated regarding new materials and subjects beyond the formal curriculum. Staff numbers have been reduced and teachers are not motivated to cover for each other and to carry out extra curricular tasks such as energy efficiency. Unions do not want teachers taking on new roles or working extra curricular hours so unfortunately it is not currently a good time to test new materials in Irish schools. During the period of this project there was a major industrial dispute between public servants and the Government in Ireland and this meant that it was difficult to involve teachers in this project. So we could say that the difficulties related to the national contest and to the economical and political situation, did not contribute to the implementation of the IUSES project in Ireland.

In general students do not demonstrate a high interest in environmental issues. The more motivated are focusing mainly on their exams and extra curricular activities such as these are often not attended.

Both students and teachers have very little time to spend on new issues and materials and this is a limiting factor. Transition Year is mainly focused on non schools activities and while this is the only possible window for materials such as those furnished by IUSES, the time is very limited and

the teachers found it difficult to fit things in. However most of them indicated that they will use the materials more in the following years.

If the IUSES related subjects were built in to the curriculum and time was allocated, it would help but that is outside the scope of this project.

With regard to the teachers' training by The Clean Technology Centre, the feedback was completely positive and they were very satisfied with this, both in terms of the handbooks content and the experimental kit. In future the training should happen in September so that the teachers have enough time to learn the material and incorporate it into that academic year. The teachers who participated have indicated that they will use the kit and the handbooks more next year than this year and overall the vast majority of feedback was very positive.

IUSES
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Report on testing activities in ITALY

Area Science Park

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0 Introduction

Testing at participating schools took place between October 2009 and May of the following year, with activities concentrating in the months of April and May 2010.
34 schools were involved in the testing phase and of those teachers taking part in the two courses for teachers, 27 filled in the questionnaires (not all teachers did). These teachers collected 408 questionnaires from their students.
Although there wasn't a specific policy implemented by the Italian partners to foster participation in the piloting of the IUSES training materials in technical schools, teachers from this kind of schools were the most interested and motivated to take part in the IUSES activities.

1 Students feedback

1.1 Students details

Age	**%**
14	3,7%
15	17,0%
16	20,9%
17	26,0%
18	20,6%
19 or more	11,8%
Average age	16,7%

Gender	**%**
Male	69
Female	31

The significant gender shift is generated by the high percentage of technical schools (see table below) which, in Italy, have a much higher percentage of male students.

Type of school	**%**
Technical	70%
Scientific	10%
Business	7%
languages/art	13%

1.2 Perception of energy consumption

What's the contribution of each of the following actions in saving energy (1 very low, 2 low, 3 fair, 4 high, 5 very high)		
	Ex ante questionnaire average	**Ex post questionnaire average**
Turning off light when nobody is in a room	3,9	4,1
Reducing heating	3,0	3,8
Switching off TV when nobody is watching it	3,2	3,7
Reducing cooling	3,4	3,7
Using low consumption light bulbs	3,8	3,9
Switching off stand-by mode of electric appliances	2,8	3,3
Choosing energy efficient appliances	3,0	3,6
Making a shower in spite of a bath	3,5	3,7
Driving the car in a environmental friendly way	2,7	3,3
Moving by foot or bike whenever possible	3,6	3,7
Buying local food	2,5	3,2

The figures in the table above demonstrate that teaching energy efficiency using the IUSES toolkit led to a better awareness of the topic. The figures of the ex post questionnaires highlight that after being taught energy efficiency, students' perception of the relevance of the various actions to save energy is not just higher but the figures are also levelled, demonstrating that IUSES raises students' awareness mostly in those areas that were previously unknown to the students (stand-by mode, reducing heating, local foods etc).

Males usually score a bit higher than females (+0,2) on average. The difference is more marked in the case of eco driving (+0,5) (probably this is linked to the different social perception of driving), whereas they score a little less when it comes to buying local food (-0,3) and buying energy efficient appliances (- 0,4).

Technical school students also have higher scores than average, but lower than males as a whole, whereas male students enrolled in a non-technical schools are those ranking the highest scores.

Answers from technical school students are quite similar to those of male students in general, because in such schools 83% of students are males. Further in-depth analysis suggests that in this case the technical school variable is more relevant than gender.

Age doesn't affect the answers of the students to this question.

1.3 Students energy behaviour

How do you go to school?	Ex ante questionnaire %	Ex post questionnaire %
By foot or bicycle	9,7%	10,8%
By public transport	10,1%	11,1%
By motorbike	21,0%	21,4%
By car	58,7%	55,8%
Using car sharing	0,5%	0,8%

As the above table shows, most students go to school by car (usually driven by their parents) or by motorbike (it's an everyday experience that in the morning in front of schools there are traffic jams).

The IUSES project had some impact on the ways students go to schools. Going to school by car was reduced by 3% with a proportionate increase in public transport usage, going by foot and bicycle or car sharing.

Girls drive a motorbike much less (-8%), but use a car (+3%) and public transport (+3%) and go by foot or bicycle (+2%) more.

Which of the following actions are you doing in your everyday life to save energy (you can choose more than one answer):	Ex ante questionnaire %	Ex post questionnaire %
Turning off light when I'm not in a room	71%	93%
Reducing heating	20%	27%
Switching off TV when nobody is watching it	74%	81%
Reducing cooling	10%	17%

Using low consumption light bulbs	45%	59%
Switching off stand-by mode of electric appliances	23%	35%
Choosing energy efficient appliances	13%	20%
Making a shower in spite of a bath	63%	76%
Driving the car in a environmental friendly way	2%	8%
Moving by foot or bike whenever possible	41%	45%
Buying local food	19%	24%

The impact of IUSES on the energy saving actions at home is much higher than that on transport. The actions on which the impact was higher are those requiring a smaller change in everyday behaviour like turning off lights, use low consumption bulbs, switching off the TV, switching off the stand-by mode (which is however still surprisingly a common behaviour performed just by 35% of the students).

57% of the students involved also other people (friends, relatives etc.) in their energy saving actions thus involving in the IUSES project further 730 people, who will themselves implement energy saving actions.

Usually male students implement energy saving actions a bit more than females (approx. +2%) and a more significant difference is revealed when it comes to reducing heating (+8%) and using low consumption light bulbs (+5%).

In the case of technical school students there are usually higher scores but smaller than the male average (on average +1%).

Although they have the same perception of the importance of energy actions as the younger students, older students (17 or more) are implementing them more than the average (+2%) in particular in relation to the stand-by mode (+4%).

1.4 Students & IUSES

Please evaluate IUSES handbooks giving a score according to the following scale :1 (very poor), 2 (poor), 3 (fair), 4 (good) 5 (very good):	**Average**
Buildings handbook:	
Clearness	3,7
Usefulness of tips and hints for everyday life	3,8
Usefulness of contents for my future studies/job	3,7
Transport handbook:	
Clearness	3,6
Usefulness of tips and hints for everyday life	3,7
Usefulness of contents for my future studies/job	3,5
Industry handbook	
Clearness	3,3
Usefulness of contents for my future studies/job	3,4

Please indicate your agreement with the following statements (1 strongly disagree, 2 disagree, 3 neither agree nor disagree, 4 agree, 5 strongly agree):	Average
a) The IUSES experiments kit helped me in understanding the contents of the lessons.	3,8
b) The multimedia DVD helped me in understanding the contents of the lessons.	4,1

Where did you use the multimedia DVD?	%
At school	30
At home	20
At school and at home	50

Male students have a better perception of the handbooks. The building and transport handbooks score on all items a +0,2 on average, with small variations. A strong appreciation is revealed for the industry handbook with +0,5 than average.

Older students (17 or more) rank scores a bit smaller than the average (-0,1 on average). This might suggest that the IUSES toolkit is perhaps more suited for younger students but the difference is not so significant to be generalised.

The industry handbook probably scored a bit less positively, probably because, being a general handbook to be used by all types of school, it is too generic for technical schools and too specific for other types of schools.

The experiment toolkit and multimedia animations have been appreciated more than the handbooks.

2 Teachers feedback

2.1 Teachers details

The average age of the teachers involved in the piloting actions in Italy is 49, and indeed 75% of the teachers is older than 45, showing that senior teachers are more interested in the project than younger ones. 58% are women and 42% men. These figures are in line with the Italian national average data.

Type of school	%
technical	74%
scientific	19%
business	4%
languages/art	4%

Which subject are you teaching:	%
Technology	70
Biology, chemistry	20
Business	10

More than half of the teachers cooperating in piloting the IUSES toolkit involved some other teachers from their own school in a multidisciplinary approach. Those supporting teachers are mostly teaching science and physics. So considering as a whole all the teachers that directly and indirectly piloted the IUSES toolkit, the number of teachers of technical subjects is more or less the same as of science teachers.

2.2 Teaching Energy Efficiency using IUSES toolkit

Teachers involved in the piloting of the IUSES toolkit taught energy efficiency to 739 secondary schools students. The number of hours devoted to teaching varied significantly ranging from 4 to 100, with an average of about 20 which is in line with the teachers' guidebook recommendation.

Before using IUSES educational kit were you already teaching energy efficiency in your lessons?	%
No	46,2%
Yes, but in a smaller number of hours	42,3%
Yes, in the same number of hours	11,5%

The data in the table above demonstrate that the IUSES project contributed to promoting the teaching of energy efficiency in secondary schools in Italy. 42% of teachers increased the number of hours devoted to the topics and 46% were completely new to the subject.

Please indicate your agreement with the following statements (1 strongly disagree, 2 disagree, 3 neither agree nor disagree, 4 agree, 5 strongly agree)	**Average**
IUSES Teachers guidebook helps teachers in preparing their lessons	4,1
IUSES Teachers guidebook gives useful information in setting up an energy saving plan	4,3

Others suggest that the teachers guidebook provide also more guidance on teaching the several topics covered by the IUSES handbooks considering a teaching plan developed during the whole length of the five secondary schools years involving more teachers in a multidisciplinary approach.

Please evaluate IUSES handbooks giving a score according to the following scale :1 (very poor), 2 (poor), 3 (fair), 4 (good) 5 (very good):	**Average**
Buildings handbook:	
Clearness	4,2
Usefulness of tips and hints for everyday life	4,1
Usefulness of contents for my future studies/job	4,0
Transport handbook:	
Clearness	4,2
Usefulness of tips and hints for everyday life	4,1
Usefulness of contents for my future studies/job	3,7

Industry handbook	
Clearness	4,1
Usefulness of contents for my future studies/job	3,8

The evaluation of the handbooks provided by the teachers is higher than that provided by students, that is not surprising, since due to a generation gap, teachers are more used to books than their students that prefer video and multimedia CD.

A more interesting difference is the higher ranking of the transport handbook evaluated by the teachers in the same way as the other handbooks

Please indicate your agreement with the following statements (1 strongly disagree, 2 disagree, 3 neither agree nor disagree, 4 agree, 5 strongly agree):	**Average**
IUSES experiments kit help students in understanding the contents of the lessons.	4,1
The multimedia DVD help students in understanding the contents of the lessons	4,1

In the case of the teachers the experiment tool kit and the multimedia CD is appreciated, on average, in the same way as the handbooks. Teachers suggest using them with younger students.

Where did the students use the multimedia DVD?	**%**
At school	20
At home	30
At school and at home	50

More than 80% of the teachers answering the questionnaires involved relatives and friends in energy savings actions involving further 126 people in IUSES actions.

96% of the teachers answering the questionnaires would recommend other teachers to use the IUSES toolkit and the same number is going to use it also in the following school year.

Just 27% of teachers schools are going to implement energy saving plans in their schools. The reason for such big difference is that an energy saving plan depends partially on the school headmasters (but in most cases this is not the problem) and mostly on the local authority managing

the schools (usually the province) that in most cases is not interested in the topics or in any case requires very long times to launch any project.

Other comments collected form teachers highlight that the topics covered by the IUSES toolkit are too wide to be taught in a single school year considering also the constraints and the obligations of the official curricula defined by the Ministry of Education (and considering the new reform of school curricula that will be applied in Italy from the 2010-2011 school year, reducing, on average and in particular in technical schools, the number of teaching hours. Therefore, increasing the number of hours devoted to energy efficiency will be harder.

It has been suggested also to develop training materials specific for kind of schools and teaching materials, an objective that is far beyond the project's possibilities.

The development of energy saving plans has been proven as a major problem for the vast majority of teachers. Even if they could in most cases persuade the school headmaster to implement an energy saving plan, any decision related to the installation and maintenance of the school building is managed by provinces (in most cases schools are not able to adjust thermostats or even read the energy meters). So the only possible actions are related to behaviour (turning off lights and appliances) or to topics just indirectly related to energy as recycling waste or saving water.

Teachers also suggest to use the IUSES kit in a plan developed more years. This way, it will be possible to further exploit the handbooks and it would be easier to develop a school energy saving plan.

2.3 Teachers behaviour

Going to school: **(multiple choices were possible)**	**A year ago (%)**	**After using IUSES toolkit**
By foot or bicycle	25	32
By public transport	7	7
By motorbike	71	64
By car	14	14
By car sharing	11	18

Teachers' ways of going to school are on average more sustainable than those of their students, since a larger number of them walks and they drive less cars (but they drive more motorbikes).

The IUSES toolkit had an impact also on their ways of going to school, since several decided to go to school by foot rather than driving a motorbike and some tried to implement a car-sharing system.

Which of the following actions have you begun to do after teaching energy efficiency in your everyday life to save energy (multiple answer possible):	**%**	**Difference with students behaviour after using the kit** **%**
Turning off light when I'm not in a room	65	-25
Reducing heating	46	+19
Switching off TV when nobody is watching it	71	-10
Reducing cooling	29	+12
Using low consumption light bulbs	71	+12
Switching off stand-by mode of electric appliances	67	+32
Choosing energy efficient appliances	61	+41
Making a shower in spite of a bath	57	-19
Driving the car in a environmental friendly way	43	+35
Moving by foot or bike whenever possible	57	+12
Buying local food	50	+26

Teachers are usually considerably more energy efficient than their students. In some cases this is related to age (decisions on what to buy or on driving a car), in others there's a generation gap. The only items that are lower than the students are those related to heating and taking a shower instead of a bath.

3 Conclusions

Despite this is not a datum specifically required by the questionnaires, the high number of teachers and students from technical schools demonstrate that energy efficiency is still perceived by teachers as a technical topic rather than a cross cutting subject to be taught to all students. Dissemination activities of the last part of the IUSES project and also other future initiatives directed towards teachers should address this issue in order to widen the impact of the IUSES project.

Summarizing the above answers the IUSES tool kit proved to be of high quality since it has been appreciated both by students and teachers and it's going to be further used also in the following

years by the very large majority of teachers. Some more guidance on the use of the kit has been suggested but overall the kit proved to work well.

An impact on students, and teachers behaviour, has been achieved demonstrating the effectiveness of the IUSES project on its major objective that is influencing students behaviour, but there's still much room for improvement since also basic energy-efficient behaviour is still far from being common and normal.

The comparison between students and teachers behaviour demonstrate a generation gap that underlines the importance of acting on students behaviour since they are used to lifestyles and comfort levels that are much more energy demanding than those of the previous generation. Such difference is indeed not generated by attitude (most surveys say that young people are sensitive to environmental issues) but from a richer lifestyle they got used to in their early childhood. So in a long term perspective actions aimed at making students more aware of the energy and environmental impact of their behaviour are extremely important.

Report on testing activities in LATVIA

JRPIC - Jelgava Regional Adult Education centre

Author: Skaidrite Bukbarde

0 Introduction

Schools involved: 15
Number of filled in questionnaires by students: 507
Number of filled in questionnaires by teachers: 22
Timeframe in which testing occurred: November 2009 – April 2010

1 Students feedback

1.1 Students details

Age	Students	%
15	7	1,381
16	141	27,811
17	183	36,095
18	131	25,838
19	40	7,89
20	4	0,789
24	1	0,197
TOTAL	507	100,00
AVERAGE	17,15	

In Latvia the IUSES testing was carried out by teachers in 15 schools, involving 507 students. The average age is 17,15 years and as we can see from the table above, the biggest groups are: 17 years old with 183 students (36,095%); 16 years old with 141 students (27,811%) and 18 years old with 131 student (25,838%). The youngest students are 15 years old (7 students - 1,381%), and the oldest one is 24 years old (0,197%).

Gender		%
women	254	50,10
men	253	49,90
TOTAL	507	100

Males and females involved in the project were almost in equal number: 254 women (50,10%) and 253 men (49,90%).

School type/education programme		%
General education programme	237	46,746
Mathematics biased programme	133	26,233
Nature studies biased programmes	0	0,000
Social sciences biased programmes	0	0,000
Humanities biased programmes	29	5,720
Professional education programmes	108	21,302
	507	100

Students involved in the IUSES project in Latvia comes mainly from general educational programmes: 46,746 % (237 students). The 26,233% (133 students), comes from scientific programmes and the 21,302% (108 students), from professional programmes. The smallest group of students comes from humanistic programmes: 5,72% (29 students).

1.2 Perception of energy consumption

Which is the contribution of each of the following actions in saving energy (1 very low, 2 low, 3 fair, 4 high, 5 very high)		
	Ex ante questionnaire average	**Ex post questionnaire average**
Turning off light when nobody is in a room	3,548	4,004
Reducing heating	3,018	3,552
Switching off TV when nobody is watching it	3,373	3,882
Reducing cooling	3,323	3,661
Using low consumption light bulbs	3,586	3,927
Switching off stand by mode of electric appliances	2,759	3,464

Choosing energy efficient appliances	3,448	3,840
Making a shower in spite of a bath	2,876	3,637
Driving the car in a environmental friendly way	3,026	3,487
Moving by foot or bike whenever possible	3,529	4,041
Buying local food	2,377	3,047

The average answer score has grown of 0.4 - 0.6 points. The biggest impact on students perceptions after the use of the toolkit, was on “making a shower in spite of a bath”. If the average rating before using the toolkit was 2,876, then after using the toolkit, the average score was 3,637. The second biggest impact is represented by “switching off stand by mode of electric appliances” (2,759 vs. 3,464) and “buying local food” (2,377 vs. 3,047).

If we look at the age groups we can see that the answers to the question “Turning off light when nobody is in a room” varies from 3,143
(15 years old students) to 5 (24 years old student). We have the opposite situation is in the next question “Reducing heating “, the lowest point (1) is in the 24 years old students group, and the highest (4 points) is in the 20 years old students group. Some students affirmed that reducing heating is technically impossible in their homes. In others groups there are no so dramatic differences and the average answers vary from 2,75 to 3,571. In the question “Switching off TV when nobody is watching it”, the answers of the age groups from 15 to 19 years old students are quite the same (3.3 points) . The age group of 20 years old students put the lowest average score (only 2,5) and the oldest age group of 24 years old students, assigned the maximum score (5).

As we can see from the table above, there are no significant differences in the provided answers between genders. The average difference is approximate 0,2 points out of 5.

The group of the 15 years old students has evaluated the question about “Reducing cooling” with a lowest average evaluation (2,75 points out of 5), in comparison to the other groups (from 3 to 3,5 points).

The only group that has marked the question about “Using low consumption light bulbs” with less than 3 points is the 20 years old students’ group, all the others have evaluated it from 3 till 3,679 points.

The students’ groups gave more or less the same score to the question “Choosing energy efficient appliances” (from 3,0 to 3,571)

"Driving the car in a environmental friendly way" was considered as an energy saving action more in the younger age groups (15-19 students) than in the older (20 and 24 years old students) which evaluated this action with a score of 2 points.

"Moving by foot or bike whenever possible" was not captured as an energy saving action only in the oldest age group (24 years old), all the others groups have evaluated this action with a high score : from 3,339 point (17 years old) till 4,25 (20 years old).

If we analyze the different data in relation to the type of school, there are no so significant differences in average scores.

BEFORE	**W**	**M**	**15**	**16**	**17**	**18**	**19**	**20**	**24**	**General educ.**	**Matem**	**Hum**	**Prof.**
Turning off light when nobody is in a room	3,630	3,466	3,143	3,553	3,459	3,733	3,400	3,250	5	3,451	3,489	4,000	3,713
Reducing heating	3,063	2,972	3,571	2,872	3,049	3,168	2,750	4	1	2,831	3,376	3,241	2,926
Switching off TV when nobody is watching it	3,492	3,253	3,143	3,312	3,301	3,534	3,475	2,5	5	3,278	3,346	3,586	3,556
Reducing cooling	3,370	3,277	2,429	3,248	3,311	3,473	3,300	3,5	3	3,173	3,511	3,552	3,361
Using low consumption light bulbs	3,760	3,411	3,143	3,652	3,541	3,679	3,425	2,75	3	3,321	3,880	3,759	3,759
Switching off stand by	2,882	2,636	2,429	2,759	2,760	2,847	2,550	2,75	2	2,759	2,677	2,828	2,843

mode of electric appliances													
Choosing energy efficient appliances	3,579	3,316	3,571	3,454	3,404	3,527	3,375	3,25	3	3,228	3,729	3,448	3,583
Making a shower in spite of a bath	2,839	2,913	3,286	2,780	2,847	2,954	3,000	3,5	1	2,713	3,075	3,310	2,870
Driving the car in a environmental friendly way	3,154	2,897	3,714	3,106	2,951	3,069	2,975	2	1	2,840	3,218	3,448	3,083
Moving by foot or bike whenever possible	3,594	3,462	3,857	3,610	3,339	3,626	3,725	4,25	1	3,376	3,662	3,655	3,667
Buying local food	2,287	2,466	1,143	2,206	2,219	2,740	2,725	2,75	1	2,346	2,180	2,310	2,704

AFTER	**W**	**M**	**15**	**16**	**17**	**18**	**19**	**20**	**24**	**General. educ.**	**Matem**	**Hum**	**Prof.**
Turning off light when nobody is in a	4,114	3,893	3,714	4,000	4,024	4,058	3,902	3,250	5,000	4,071	4,138	4,048	3,887

room													
Reducing heating	3,559	3,545	3,571	3,462	3,651	3,506	3,541	4,000	2,000	3,582	3,655	3,619	3,458
Switching off TV when nobody is watching it	4,047	3,715	3,286	3,839	3,929	3,837	4,066	3,250	5,000	3,929	3,931	3,952	3,768
Reducing cooling	3,685	3,636	4,000	3,677	3,728	3,616	3,607	3,750	3,000	3,619	3,879	3,619	3,679
Using low consumption light bulbs	4,031	3,822	3,571	3,968	3,905	3,924	4,033	3,750	3,000	3,937	4,224	3,857	3,839
Switching off stand by mode of electric appliances	3,437	3,490	3,143	3,462	3,615	3,395	3,492	2,750	3,000	3,556	3,534	3,190	3,423
Choosing energy efficient appliances	3,976	3,704	4,000	3,677	3,781	3,977	3,934	3,500	2,000	3,883	3,983	3,857	3,738
Making a shower in spite of a bath	3,736	3,538	3,714	3,613	3,710	3,703	3,328	3,250	3,000	3,494	3,948	3,619	3,744
Driving the car in a	3,594	3,379	3,714	3,710	3,491	3,390	3,443	3,000	2,000	3,368	3,966	3,667	3,446

environmental friendly way													
Moving by foot or bike whenever possible	4,260	3,822	4,429	3,989	4,118	4,012	4,016	4,250	2,000	4,134	4,207	3,667	3,964
Buying local food	3,106	2,988	4,143	3,108	3,101	2,936	2,984	3,000	4,000	2,916	3,310	2,952	3,167

1.3 Students energy behaviour

How do you go to school?	Ex ante questionnaire %	Ex post questionnaire %
By foot or bicycle	53,254	56,213
By public transport	21,302	22,485
By motorbike	2,170	1,578
By car	12,032	10,256
Using car sharing	11,243	9,467

The use of IUSES toolkit, book and DVD have increased the number of students that prefer going to school by foot or by bicycle (from 53,254% to 56,213%) and that go to school by public transport (from 21,302% to. 22,485%). The number of students going to school by motorbike has decreased from 2,170% to 1,578%. Car users passed from 12,032% to 10,256%. We have almost the same situation with student adopting car sharing (11,243% vs. 9,467). To sum up, the project activities have significantly increased the number of students using energy effective ways of going to school.

Which of the following actions are you doing in your everyday life to save energy (you can choose more than one answer):	Ex ante questionnaire %	Ex post questionnaire %
Turning off light when I'm not in a room	90,730	91,124

Reducing heating	6,509	18,738
Switching off TV when nobody is watching it	81,854	85,799
Reducing cooling	14,004	21,302
Using low consumption light bulbs	41,026	55,227
Switching off stand by mode of electric appliances	25,641	37,475
Choosing energy efficient appliances	16,568	23,866
Making a shower in spite of a bath	48,521	62,327
Driving the car in a environmental friendly way	7,298	13,609
Moving by foot or bike whenever possible	62,130	71,992
Buying local food	44,379	45,168

If we analyze the questions about the actions that students do in their everyday life, we can see that the biggest part of students in ante as well as in post questionnaires do the following action: “Turning off the light when not in a room”.

The second most common action among students is “Switching off TV when nobody is watching it” (81,854% before and 85,799% after).

An other actions that students are doing is “Moving by foot or bike whenever possible”. If in the ante questionnaires the percentage of students doing this action was 62,130% , in the post questionnaires the number of students making this action has grown almost of 10% achieving **the** 71,992%.

The highest number of students changing their everyday actions to save energy can be noticed in the action “Using low consumption light bulbs”. We passed from 41,026% to 55,227% (+14%), and in the action “Making a shower instead of a bath” where we passed from 48,521% to 62,327%.

The big impact has been made for growth Reducing heating and Reducing cooling actions to save energy. If in ante questionnaire there were only 6,509% and 14,004% , then in post questionnaire -

18,738% and 21,302%. Still Switching off stand by mode of electric appliances has a growth of 12% between student number doing this action – in ante questionnaire there were 25,641% and in post questionnaire - 37,475%.

Only a few students are "Driving the car in a environmental friendly way" (7,298% vs. 13,609%), but this could easily explained by the fact that the average age of the students was 17,15 years and in Latvia only people over 18 years are allowed to drive alone.

Involvement

152 students (29,980%) involved at least one more person in reducing energy consumption. The average is 4,132 persons involved for each student. In general every student that involved someone else in the project had an impact on 1,239 persons.

Before	**Female**	**male**	**15**	**16**	**17**	**18**	**19**	**20**	**24**	**General educ.**	**Matem**	**Hum**	**Prof.**
Turning off light when nobody is in a room	94,094	87,352	100,000	90,071	90,710	90,076	92,500	100,000	100,000	88,186	93,985	89,655	92,193
Reducing heating	5,906	7,115	0,000	7,092	4,918	5,344	17,500	0,000	0,000	4,219	7,519	13,793	8,333
Switching off TV when nobody is watching it	86,220	77,470	100,000	76,596	81,967	85,786	80,000	50,000	100,000	83,966	82,707	68,966	79,630
Reducing cooling	14,567	13,439	0,000	17,021	10,929	15,267	15,000	25,000	0,000	15,190	15,038	13,793	10,185
Using low consumption light bulbs	42,520	39,526	57,143	37,589	38,251	46,565	47,500	25,000	0,000	36,709	45,113	44,828	44,444
Switchin	22,0	29,	0,00	25,	26,	27,	20,	50,0	0,00	27,0	30,0	17,	19,

g off stand by mode of electric applianc es	47	249	0	532	230	481	000	00	0	04	75	241	444
Choosin g energy efficient applianc es	12,5 98	20, 553	14,2 86	10, 638	15, 847	21, 374	22, 500	25,0 00	100, 000	15,6 12	15,7 89	13, 793	20, 370
Making a shower in spite of a bath	46,0 63	50, 988	100, 00	48, 936	42, 077	51, 908	57, 500	50,0 00	0,00 0	43,4 60	56,3 91	62, 069	46, 296
Driving the car in a environ mental friendly way	1,96 9	12, 648	0,00 0	4,9 65	2,7 32	10, 687	25, 000	25,0 00	0,00 0	7,59 5	3,75 9	6,8 97	11, 111
Moving by foot or bike whenever possible	65,7 48	58, 498	85,7 14	65, 957	61, 749	59, 542	60, 000	25,0 00	0,00 0	63,2 91	67,6 69	48, 276	56, 481
Buying local food	46,0 63	42, 688	42,8 57	38, 298	46, 995	47, 328	50, 000	0,00 0	0,00 0	46,8 35	39,8 50	34, 483	47, 222

After	**Fem ale**	**mal e**	**15**	**16**	**17**	**18**	**19**	**20**	**24**	**Gen eral educ .**	**Mat em**	**Hu m**	**Pro f.**
Turning off light when	94,4 88	88, 538	100, 000	90, 323	92, 899	93, 605	93, 443	100, 000	100, 000	94,5 61	94,8 28	92, 857	92, 262

nobody is in a room													
Reducing heating	18,898	18,577	0,000	18,280	15,976	19,186	26,230	25,000	100,000	19,247	22,414	28,571	14,286
Switching off TV when nobody is watching it	89,370	82,213	100,000	87,097	88,757	86,628	95,082	75,000	100,000	89,958	86,207	69,048	86,310
Reducing cooling	19,685	22,925	14,286	17,204	20,118	23,837	26,230	25,000	0,000	22,594	20,690	14,286	22,024
Using low consumption light bulbs	55,906	54,545	57,143	65,591	62,130	45,930	52,459	25,000	0,000	53,556	74,138	52,381	52,976
Switching off stand by mode of electric appliances	35,827	36,759	28,571	35,484	36,095	36,047	42,623	50,000	0,000	41,423	43,103	28,571	29,762
Choosing energy efficient appliances	20,866	26,877	57,143	18,280	21,893	29,651	18,033	25,000	100,000	26,778	34,483	14,286	20,833
Making a shower in spite of a bath	61,417	63,241	100,00	56,989	63,314	70,930	59,016	50,000	0,000	69,456	68,966	66,667	55,357
Driving the car in a	10,630	16,601	0,000	21,505	8,284	10,465	27,869	25,000	0,000	12,134	17,241	11,905	14,881

environmental friendly way													
Moving by foot or bike whenever possible	74,409	69,565	85,714	79,570	72,781	69,767	67,213	25,000	0,000	70,293	72,414	85,714	70,833
Buying local food	46,457	47,431	71,429	45,161	47,337	47,674	50,820	25,000	0,000	54,393	55,172	28,571	47,619

1.4 Students & IUSES

Please evaluate IUSES handbooks giving a score according to the following scale: 1 (very poor), 2 (poor), 3 (fair), 4 (good) 5 (very good):	**Average**
Buildings handbook:	
Clearness	3,613
Usefulness of tips and hints for everyday life	3,805
Usefulness of contents for my future studies/job	3,536
Transport handbook:	
Clearness	3,757
Usefulness of tips and hints for everyday life	3,903

Usefulness of contents for my future studies/job	3,694
Industry handbook	
Clearness	3,542
Usefulness of contents for my future studies/job	3,499

Please evaluate IUSES …	**female**	**male**	**15**	**16**	**17**	**18**	**19**	**20**	**24**	**General educ.**	**Matem**	**Hum**	**Prof.**
Buildings handbook:													
Clearness	3,669	3,557	3,857	3,774	3,556	3,587	3,607	3,500	2,000	3,548	3,466	3,714	3,732
Usefulness of tips and hints for everyday life	3,791	3,818	3,429	3,656	3,864	3,884	3,738	3,750	1,000	3,795	3,431	4,000	3,899
Usefulness of contents for my future studies/job	3,504	3,569	4,000	3,484	3,467	3,599	3,541	4,250	3,000	3,393	3,500	3,667	3,720

Transport handbook:													
Clearness	3,764	3,751	4,143	3,742	3,763	3,814	3,574	4,250	1,000	3,711	3,534	3,857	3,875
Usefulness of tips and hints for everyday life	3,949	3,858	3,714	3,892	3,941	3,953	3,738	3,750	2,000	3,837	3,569	4,095	4,065
Usefulness of contents for my future studies/job	3,713	3,676	3,429	3,720	3,781	3,674	3,525	4,000	1,000	3,548	3,414	4,143	3,887
Industry handbook													
Clearness	3,591	3,494	4,000	3,602	3,414	3,622	3,574	3,500	1,000	3,490	3,397	3,667	3,637
Usefulness of contents for my future studies/job	3,453	3,545	4,000	3,656	3,456	3,407	3,541	4,500	2,000	3,280	3,379	3,810	3,774
Please indicate your …..													

a) The IUSES experiments kit helped me in understanding the contents of the lessons.	3,673	3,542	3,857	3,559	3,609	3,674	3,459	4,000	2,000	3,603	3,293	4,048	3,613
b) The multimedia DVD helped me in understanding the contents of the lessons.	3,768	3,648	4,143	3,656	3,675	3,808	3,525	4,250	3,000	3,808	3,259	4,048	3,637

Please indicate your agreement with the following statements (1 strongly disagree, 2 disagree, 3 neither agree nor disagree, 4 agree, 5 strongly agree):	**Average**
a) The IUSES experiments kit helped me in understanding the contents of the lessons.	3,607
b) The multimedia DVD helped me in understanding the contents of the lessons.	3,708

Where did you use the multimedia DVD?	**%**
At school	62,239

At home	20,813
At school and at home	16,876

Most of the students (62,239%) used the IUSES DVD at school, the 20,813% used it at home and the 16,876% used it both at school and at home.

Where did you use the multimedia DVD? %	**female**	**male**	**15**	**16**	**17**	**18**	**19**	**20**	**24**	**General educ**	**Matem**	**Hum**	**Prof.**
At school	63,386	60,870	14,286	67,742	59,172	65,698	55,738	75,000	100,000	67,364	63,793	61,905	54,167
At home	20,079	21,344	42,857	20,430	22,485	15,698	27,869	25,000	0,000	17,155	17,241	14,286	28,571
At school and at home	16,535	17,787	42,857	11,828	18,343	18,605	16,393	0,000	0,000	15,481	18,966	23,810	17,262

The range of the students' evaluation goes from 3.5 to 3.9. The highest score was given to the usefulness of the tips and hints for everyday life in the "transport and building handbooks". The lowest scores were given to the "industry handbook" as it is not very close to students' everyday life. The general evaluation of the handbooks and the toolkit is anyway positive.

2 Teachers feedback

2.1 Teachers details

Average age: 48,5 years old. These teachers work mainly with senior students.

gender (10% males, 90 % females)

Type of school	%
General education schools	100%

Which subject are you teaching:	%
Technology	0,00
Biology, chemistry	8,33
Physics	41,67
Math	16,67
Literature, history, philosophy	8,33
Foreign language	8,33
Art	0,00
Other (specify)	16,67-Latvain language, geography

Teachers indicated that the energy efficiency questions have been discussed during the following hours of lesson: physics, science, chemistry, foreign languages, geography, economics, social sciences, arts, home economics.

Teachers' answers prove that energy efficiency issues have been integrated into the study programmes of different subjects.

2.2 Teaching Energy Efficiency using IUSES toolkit

The number of hours devoted to teaching energy efficiency is different from school to school. The maximum of taught hours is 14 (the average is 10.4). The number of students involved in testing the training material is 698.

The majority of the teachers stated that they had been teaching energy efficiency issues before participating to IUSES but dedicating a smaller number of hours to the topic. Only the 10 % of the teachers started to teach these topic during the testing period.

Before using IUSES educational kit were you already teaching energy efficiency in your lessons?	**%**
No	10
Yes, but in a smaller number of hours	80
Yes, in the same number of hours	10

Please indicate your agreement with the following statements (1 strongly disagree, 2 disagree, 3 neither agree nor disagree, 4 agree, 5 strongly agree)	**Average**
IUSES Teachers guidebook helps teachers in preparing their lessons	4,6
IUSES Teachers guidebook gives useful information in setting up an energy saving plan	4,8

The teachers have highly evaluated the usefulness of the information given for the setting up of an energy saving plan.

Please evaluate IUSES handbooks giving a score according to the following scale :1 (very poor), 2 (poor), 3 (fair), 4 (good) 5 (very good):	**Average**
Buildings handbook:	
Clearness	4,3
Usefulness of tips and hints for everyday life	4,5
Usefulness of contents for my future studies/job	4,5
Transport handbook:	

Clearness	4,2
Usefulness of tips and hints for everyday life	4,5
Usefulness of contents for my future studies/job	4,4
Industry handbook	
Clearness	4,3
Usefulness of contents for my future studies/job	4,4

The teachers' evaluation of the handbooks is higher than the students' one ("building handbook": 4.3 vs 4.5; "transport handbook": 4.2 vs 4.5; "industry handbook": 4.3 vs 4.4). The highest score has been given to "usefulness of tips and hints for everyday life in transport and building". Although students have given lower scores to the handbooks, they have also given high evaluation. That means that both the teachers and the students really appreciated the tips and hints given. This could be explained also by the fact that these questions are closely connected with their everyday life.

The teachers have mentioned in their comments that tips on driving, practical examples and exercises were particularly useful. The teachers appreciate also information on new technologies-solar energy, heat pumps. They have noted that sometimes information is a bit too complicated for schools with general programmes of education (e.g. constructions and construction materials in buildings, bio fuel). On the contrary experts working in technical schools had different opinions, the information was very useful for their study programmes. In general teachers found very useful the experimental kit and the DVD, they have commented that the energy meter, the solar panels and the digital thermometer helped them to explain the energy efficiency questions to the students.

Please indicate your agreement with the following statements (1 strongly disagree, 2 disagree, 3 neither agree nor disagree, 4 agree, 5 strongly agree):	**Average**
IUSES experiments kit help students in understanding the contents of the lessons.	4,7
The multimedia DVD help students in understanding the contents of the lessons	4.7

Where did the students use the multimedia DVD?	%
At school	70
At home	35
At school and at home	40

The teachers indicated that they have mainly used the multimedia toolkit at school. 100% of the teachers would suggest to their colleagues to use the IUSES educational kit. 100 % of the teachers are going to use the IUSES educational toolkit next year. 100% of the schools are going to implement energy saving plans in the near future. The teachers affirmed they are going to implement a lot of activities: energy control, project works done by students, competitions, actions as planting trees, collecting used paper etc.

2.3 Teachers behaviour

Going to school:	A year ago (%)	After using IUSES toolkit
By foot or bicycle	36,36	63,64
By public transport	27,27	27,27
By motorbike	0	0
By car	27,27	0
By car sharing	9,09	9,09

Which of the following actions have you begun to do after teaching energy efficiency in your everyday life to save energy (multiple answer possible):	%
Turning off light when I'm not in a room	60
Reducing heating	0
Switching off TV when nobody is watching it	70
Reducing cooling	10

Using low consumption light bulbs	70
Switching off stand by mode of electric appliances	60
Choosing energy efficient appliances	50
Making a shower in spite of a bath	70
Driving the car in a environmental friendly way	10
Moving by foot or bike whenever possible	60
Buying local food	50

As we can see from the answers provided by the teachers we can say that their behaviours are energy efficient, as 63,64 % of the teachers go to school by foot or by bicycle. The teachers do almost all the energy efficient actions with some exceptions. For example no one reduces heating, which can be explained not by their attitude but by situation in the country. Reducing heating is almost impossible in apartments so this action is technically impossible. The same situation can be noticed with the action “reducing cooling”, as cooling is used only in public buildings, not in private.

80% of the teachers have involved at least one friend or relative in changing its attitude and behaviour regarding energy efficiency. The average of involved persons is 3,63 for each teacher.

3 Conclusions

The teachers’ and students’ answers prove that most of them have energy efficient behaviours and they have improved them after using the IUSES toolkit. Their answers show that there are several actions which cannot be performed in their houses as reducing heating and cooling. , so the students and teachers highly appreciated the tips and hints on this issue. Driving the car in an environmental friendly way is not very common for many students and teachers but we have to take into consideration that the majority of the students involved in testing phase do not have a driving licence yet and this might influence their attitude to answer to this question.

The teachers and students evaluations of the handbooks are slightly different. Teachers have given higher evaluation than students. The highest scores have been given to “tips and hints on driving and building” both by students and teachers. Neither age nor gender influenced students’ energy efficient behaviours. The teachers have highly evaluated the DVD and the instrumental kit as it helped to make their lessons more practical and they helped the students’ in understanding the discussed issues. The teachers found very useful also the practical examples and exercises.

The time devoted to test the handbooks was not enough to cover all the materials included on them. Notwithstanding all teachers have expressed their commitment to use the educational kit next year.

IUSES
Contract number:IEE/07/828/SI2.499427

Report on testing activities in THE NETHERLANDS

IVAM UvA

Author: Jan Uitzinger
Lieke Dreijerink

0 Introduction

In the Dutch IUSES project, five different schools were involved. In Amsterdam, Hilversum, Zeist, Hoofddorp and Valkenswaard. The project was performed in class from December 2009 until May 2010. The project was evaluated among teachers in face-to-face interviews or over the telephone. The teachers also indicated how the students experienced the project. Since the teachers did not hand out the questionnaires before the project, the IUSES evaluation as planned was not possible. Therefore a back sight evaluation was performed among the group of students (n=22, from three different schools) that visited the price winning event. The survey was somewhat adjusted to the Dutch situation and the fact that the survey was retrospective

1 Students

1.1 Students details

Age	**%**
14	0
15	46
16	41
17	14
18	0
Average age	16

Gender	**%**
Male	64
Female	36

Type of school:

	%
VMBO (vocational education)	18
HAVO (general education)	9
VWO (preparatory for university)	73

1.2 Perception of energy consumption

What's the contribution of each of the following actions in saving energy (1 very low, 2 low, 3 fair, 4 high, 5 very high)	
	Average
Turning off light when nobody is in a room	3.9
Reducing heating	4.1
Switching off TV when nobody is watching it	3.5
Reducing cooling	3.6
Using low consumption light bulbs	4.0
Switching off stand-by mode of electric appliances	3.7
Choosing energy efficient appliances	4.1
Taking a shower instead of a bath	3.1
Driving the car in a environmental friendly way	3.8
Moving by foot or bike whenever possible	4.2
Buying local food	3.2

It is impossible to analyse the impact of the IUSES project on the perception of energy consumption, since there was no before measurement. The group of students is too small to draw conclusions on differences between ages and genders.

1.3 Students' energy behaviour

None of the students changed their travel mode because of the IUSES project. The main reason is that they already went to school on foot, by bike or by public transport.

How do you go to school?	**%**
By foot or bicycle	82%
By public transport	2%
By motorbike	0%
By car	0%
Using car sharing	0%

Students were asked if they changed their energy behaviour because of the school project. Fifty percent of the students (n=11) did not adjust their energy related behaviour because of the project. The other 50 percent stated they did change their behaviour because of the project. Next, they filled in which actions they changed. The following table shows the percentage of students that changed certain actions, within the group of students that changed their energy behaviour.

Which of the following actions have you changed in your everyday life to save energy because of the project:	**%**
Turning off light when I'm not in a room	36%
Reducing heating	14%
Switching off TV when nobody is watching it	9%
Reducing cooling	5%
Using low consumption light bulbs	14%
Switching off stand by mode of electric appliances	14%
Choosing energy efficient appliances	5%
Taking a shower instead of a bath	14%
Driving the car in a environmental friendly way	Not applicable
Moving by foot or bike whenever possible	9%
Buying local food	5%
I saved energy, but do not exactly know how	14%

Twenty-seven percent of all the students involved others in saving energy; mostly in their own families. The number of people they involved ranged from two to seven.

1.4 Students & IUSES

The Dutch teachers did not use the handbooks, but mostly the PowerPoint presentation IVAM made out of the Handbooks. The teachers involved were creative in collecting information on the topic from different sources and make their own lessons out of it. Since the handbooks were not available in time and the PowerPoint was; they used the PowerPoint. They experienced the PowerPoint as useful and therefore they used it in class.

The students did not come into direct contact with the handbooks. The toolkit was evaluated positively: they especially liked to see the PV cell. The energy meter was too difficult to operate for one of the teachers. Not for the others. The education level of students influences of course the use

of the kit. Since teachers made their own lessons out of it, they adjusted it to the appropriate level of their students.

For the Dutch school system, heavy handbooks are not very usable for project hours. During regular classes teachers work through books with questions and assignments at the end of each chapter. But for project hours they want more practical education material.

2 Teachers feedback

Feedback from teachers was gathered in face-to-face interviews or in telephone calls. The questionnaires were not used. Therefore, the evaluation tables cannot be filled in.

2.1 Teachers details

The teachers involved were all senior teachers with a special interest in the sustainability topic. Most of them already developed some kind of lessons on environmental issues in the past. Schools differed from vocational education to preparatory education for university. In the Netherlands, schools often teach all levels of education and teachers mostly teach on all levels of education. The subject of teachers varied: history, physics, mathematics, biology.

2.2 Teaching Energy Efficiency using IUSES toolkit

The number of hours spend on teaching energy efficiency differed from 8 to 16 hours. In total about 100 students were trained using some part of the IUSES toolkit. As stated before, teachers used only specific parts of the toolkit in their lessons. Training of students by using the IUSES toolkit was therefore different for students of different schools.

The handbooks and the teacher's guidebook were not ready in time so it was not easy for teachers to include these. As a substitute for the handbooks, they received the IVAM PowerPoint in an earlier phase; therefore, they started working from there. In general, they were impressed by the content of the handbooks, but it was too much workload for the teachers to translate the handbooks into a practical project. In the projects, most of the schools motivated the students to look at their own energy saving behaviour and make a project out of it. The projects were extended by looking at documentaries or movies and visiting sights related to the topic. The energy saving plan for the school itself was not used in the way intended.

The teachers were enthusiastic about the experimental toolkit and used them in class. The multimedia DVD was not ready in time and was therefore not used.

3 Conclusions

To be useful for project hours in the Dutch school system, the IUSES kit needs to be adjusted more than will be the outcome of the whole IUSES project. Teachers used parts of it in their classes. Most of them will keep the topic on their schools agenda (except for the ones leaving the school system), but since they are very creative they make their own projects out of different materials. This will also be the case for the IUSES materials: they will use those parts that have proven to be useful (PowerPoint and Experimental Kit).

Most of the teachers interested in the IUSES kit were already involved in teaching on the topic of sustainability or energy saving. They were active in their schools and were spreading their enthusiasm. To include teachers and schools that are less enthusiastic, a clearly defined project is necessary. They have to be persuaded that the project is educational, interesting and fun to do and that it takes not too much time and effort.

Another lesson learnt is timing. In spring, Dutch schools plan their program for the next year. When you want to offer a project, you need to do it during that time. In addition, be aware of the fact that schools get many project offers.

Report on testing activities in ROMANIA

PUB - Polytechnic University of Bucharest

Authors: Laurentiu Fara
Dragos Comaneci

0 Introduction

Schools involved:
Colegiul Tehnic Media, Colegiul National Octav Onicescu, Liceul de Metrologie Traian Vuia, Colegiul National Iulia Hasdeu, Grup Scolar Industrial Dacia, Grup Scolar Electronica Industriala, Colegiul National Ion Creanga, Liceul Teoretic Dance Alighieri, Colegiul Tehnic Edmond Nicolau, Grup Scolar de Constructii Montaj Mihai Bravu, Grup Scolar Industrial Grigore Cerchez, Colegiul National Gheorghe Sincai, Liceul Teoretic Eugen Lovinescu, Colegiul National Dinicu Golescu.
Number of filled in questionnaires by students : 200
Number of filled in questionnaires by teachers : 31
Timeframe in which testing occurred : November 15 2009 – March 25 2010

1 Students feedback

1.1 Students details

1.2

Age	**%**
15	7.80%
16	41.55%
17	37.65%
18	13.00%
Average age	16.55

Gender	**%**
Male	46.75
Female	53.25

Type of school	**%**
technical	79.23%
scientific	20.77%

1.3 Perception of energy consumption

What's the contribution of each of the following actions in saving energy (1 very low, 2 low, 3 fair, 4 high, 5 very high)		
	Ex ante questionnaire average	**Ex post questionnaire average**
Turning off light when nobody is in a room	4.71	4.77
Reducing heating	3.44	4.16
Switching off TV when nobody is watching it	4.43	4.53
Reducing cooling	4.34	4.66
Using low consumption light bulbs	4.43	4.88
Switching off stand by mode of electric appliances	3.04	4.16
Choosing energy efficient appliances	4.2	4.44
Making a shower in spite of a bath	3.65	4.41
Driving the car in a environmental friendly way	3.95	4.16
Moving by foot or bike whenever possible	4.2	4.83
Buying local food	3.47	4

The IUSES toolkit had a positive impact in the student perception about energy efficiency and energy saving topics. As we can see from the comparison between the pre-course feedback and the feedback provided after the course, all the post-course feedback averages are higher than those of the pre-course feedback.

Gender, age and school type had no distinguishable impacts upon the answers given by the students.

1.3 Students energy behaviour

How do you go to school?	Ex ante questionnaire %	Ex post questionnaire %
By foot or bicycle	16.14%	19.20%
By public transport	43.18%	45.12%
By motorbike	1.21%	1.21%
By car	28.24%	21.25%
Using car sharing	11.23%	13.22%

Which of the following actions are you doing in your everyday life to save energy (you can choose more than one answer):	Ex ante questionnaire %	Ex post questionnaire %
Turning off light when I'm not in a room	65.00%	67.00%
Reducing heating	52.00%	60.00%
Switching off TV when nobody is watching it	41.00%	49.00%
Reducing cooling	35.00%	44.00%
Using low consumption light bulbs	41.00%	62.00%
Switching off stand by mode of electric appliances	21.00%	43.00%
Choosing energy efficient appliances	23.00%	31.00%
Making a shower in spite of a bath	92.00%	94.00%
Driving the car in a environmental friendly way	33.00%	41.00%
Moving by foot or bike whenever possible	16.00%	21.00%
Buying local food	47.00%	53.00%

The IUSES toolkit had an average impact of 9% on the energy behaviours of students. Improvement percentages ranged from 2% up to 22%. In their energy saving actions, students mainly involved their families.

Gender played a role in the question regarding “Driving the car in an environmental friendly way”. Females had a greater improvement ratio than males. For all the other questions, age, gender and type of school, have not played an important role.

1.4 Students & IUSES

Please evaluate IUSES handbooks giving a score according to the following scale :1 (very poor), 2 (poor), 3 (fair), 4 (good) 5 (very good):	**Average**
Buildings handbook:	
Clearness	4.1
Usefulness of tips and hints for everyday life	4.2
Usefulness of contents for my future studies/job	3.1
Transport handbook:	
Clearness	3.9
Usefulness of tips and hints for everyday life	4.3
Usefulness of contents for my future studies/job	3.25
Industry handbook	
Clearness	3.4
Usefulness of contents for my future studies/job	2.8

Please indicate your agreement with the following statements (1 strongly disagree, 2 disagree, 3 neither agree nor disagree, 4 agree, 5 strongly agree):	Average
a) The IUSES experiments kit helped me in understanding the contents of the lessons.	4.7
b) The multimedia DVD helped me in understanding the contents of the lessons.	3.5

Where did you use the multimedia DVD?	%
At school	12.00%
At home	53.00%
At school and at home	8.00%

The overall evaluation of the toolkit was 3.72 out of 5 possible. There might be an educational element influencing the answers regarding the usefulness of the materials in their future studies/job. Most of the high schools we have collaborated with, are technical ones and, since the handbooks are destined also to people with a non-technical background, some of the students already knew part of the contents of the handbooks. Thus they considered the handbooks to have a low degree of usefulness in their future studies/job. Everyday usefulness averages were high, indicating that students considered the tips to be very practical and easy to implement.

Once again age and gender did not have any important role in the answers provided by students. No distinguishable patterns were noticed between the answers provided and the age, gender and type of school of the student.

Overall, the students considered the quality of the IUSES toolkit to be ‘above the average’ and they greatly appreciated the experimental kit. The “transport handbook” was the most appreciated in terms of usefulness.

Only scientific and technical schools participated to the IUSES project, so students from the other types of schools could have different opinions.

2 Teachers feedback

2.1 Teachers details

The teachers are mostly senior with an average age of 45 years. They are also mostly female teachers (90,4%).

Type of school	%
technical	58.8
scientific	41.2

Which subject are you teaching:	%
Technology	3.20%
Biology, chemistry	21.80%
Physics	40.30%
Math	4.20%
Literature, history, philosophy	3.80%
Foreign language	1.60%
Art	1.40%
Other (specify)	22.50%

2.2 Teaching Energy Efficiency using IUSES toolkit

Total number of hours devoted to teaching energy efficiency: 305

Total number of students trained using IUSES toolkit: 718

Average number of hours devoted to teaching energy efficiency: 9.84

Average number of students trained using IUSES toolkit : 23.16

Before using IUSES educational kit were you already teaching energy efficiency in your lessons?	%
No	35.20%
Yes, but in a smaller number of hours	31.30%
Yes, in the same number of hours	33.50%

Please indicate your agreement with the following statements (1 strongly disagree, 2 disagree, 3 neither agree nor disagree, 4 agree, 5 strongly agree)	**Average**
IUSES Teachers guidebook helps teachers in preparing their lessons	4.3
IUSES Teachers guidebook gives useful information in setting up an energy saving plan	4.2

Please evaluate IUSES handbooks giving a score according to the following scale :1 (very poor), 2 (poor), 3 (fair), 4 (good) 5 (very good):	**Average**
Buildings handbook:	
Clearness	4.4
Usefulness of tips and hints for everyday life	3.9
Usefulness of contents for my future studies/job	3.2
Transport handbook:	
Clearness	4.5
Usefulness of tips and hints for everyday life	4.1
Usefulness of contents for my future studies/job	3.4
Industry handbook	

Clearness	3.9
Usefulness of contents for my future studies/job	3.4

Please indicate your agreement with the following statements (1 strongly disagree, 2 disagree, 3 neither agree nor disagree, 4 agree, 5 strongly agree):	**Average**
IUSES experiments kit help students in understanding the contents of the lessons.	4.9
The multimedia DVD help students in understanding the contents of the lessons	3.8

Where did the students use the multimedia DVD?	**%**
At school	11.30%
At home	67.60%
At school and at home	21.10%

How many teachers would suggest to other teachers to use IUSES educational kit? (question 18)

All of the teachers, namely 31 teachers who completed the feedback questionnaire, would suggest to other teachers to use the IUSES educational kit.

How many teachers are going to use IUSES educational toolkit next year? (question 19)

29 teachers expressed their intention to use the educational toolkit next year.

How many schools are going to implement energy saving plan? Summarize briefly details (question 20)

9 schools are going to implement the energy saving plan.

Schools intend to organize dissemination campaigns within the student body and within the local community. Also, the technical schools wish to build some energy saving gadgets (automated light

switches, power consumption monitoring devices, etc.). Some schools wish to experiment with passive lighting solutions (optic fibres, mirrors, etc) in order to light up their underground floors during the day.

Summarize final suggestions (question 21) and add your comments

Some teachers suggested that the handbooks should contain more complex information regarding the subject at hand. This is due to the fact that most of the teachers are from technical high schools. A few teachers had some negative comments regarding the informative package contained in the teacher handbook, especially the physics curricula.

Is the type of school, subjects taught, age or gender of teachers influencing the answers provided by teachers?

The only factor influencing the answer is the type of school. In our case, the dominating type have been the technical ones.

2.3 Teachers behaviour

Going to school:	**A year ago (%)**	**After using IUSES toolkit**
By foot or bicycle	5.00%	6.00%
By public transport	65.00%	68.00%
By motorbike	0.00%	0.00%
By car	20.00%	16.00%
By car sharing	10.00%	12.00%

Which of the following actions have you begun to do after teaching energy efficiency in your everyday life to save energy (multiple answer possible):	**%**
Turning off light when I'm not in a room	64.00%
Reducing heating	71.00%
Switching off TV when nobody is watching it	33.00%
Reducing cooling	55.00%
Using low consumption light bulbs	68.00%

Switching off stand by mode of electric appliances	23.00%
Choosing energy efficient appliances	35.00%
Making a shower in spite of a bath	95.00%
Driving the car in a environmental friendly way	67.00%
Moving by foot or bike whenever possible	27.00%
Buying local food	41.00%

Is teachers behaviour energy efficient?

Teachers, as many inhabitants of Bucharest, use the public transport system. From that point of view, their behaviour can be considered energy efficient and efficient also from an economic point of view.

Did IUSES have an impact on their behaviour?

After they started teaching using the IUSES tool kit, we have seen a reduction in the number of teachers that use a car to get to school and an increase in both public transport and car sharing. The number of teachers that use a bicycle to go to school, unfortunately remains constant. We can also see that the age of the teachers increases their risk aversion towards monocycles, none of the teachers that provided feedback is using a motorcycle to get to school.

3 Conclusions

The teachers' answers seem to be coherent with the answers provided by the students, especially in the evaluation of the handbooks. The teachers had slightly higher averages regarding the usefulness of the handbooks than the students. The explanation here would be the big age gap between the students and the teachers. Teachers, having more experience tend to recognize useful information easier.

The lesson learnt, both by students and teachers alike, is the importance of studying energy saving matters and the fact that it can be quite fun and creative to find ways of doing that.

The experimental kit had a top average grade both from student and teacher. From the comments received by the teachers, we noticed that the students enjoyed the experimental kit most of all. One can easily see why the experimental kit had the most relevant impact: schools were mostly technical and for this kind of student doing practical actions is a lot more stimulating than just learning from a textbook.

The handbooks could be improved, especially the "teachers handbook". More complex information and examples should be added to the handbooks in order to satisfy the needs of more educated technical students.

IUSES
Contract number:IEE/07/828/SI2.499427

Report on testing activities in SLOVENIA

Slovenski E-forum

Author: Maja Blejec

0 Introduction

Schools involved: 14

Number of filled in questionnaires by students (ante): 652

Number of filled in questionnaires by students (post): 488 (It does not include the two questions about DVD).

Time frame in which testing occurred: January 15th 2010 - March 31st 2010

* Post testing was done in two phases. In the first phase the schools were asked to test everything but the DVD. In the second phase the schools were asked to test the DVD. The two phases were implemented because the DVD was available later than the handbooks.. So for the two questions on DVD the above information is the following.

Schools involved: 6

Number of filled in questionnaires by students: 116

Time frame in which testing occurred: April 29th 2010 - May 20th 2010

The second phase of the post testing has been completed by a lower number of schools. We found some difficulties to motivate schools to do the testing twice.

1 Students feedback

1.1 Students details

Age	**%**
14	0,00
15	29,40
16	46,70
17	17,30
18	4,00
19	16,10
20	1,30
21	1,30
Average age	**16,10**

Gender	%
Male	52
Female	48

Type of school	%
technical	33,3
scientific	0,00
business	8,30
languages/art	58,40

1.2 Perception of energy consumption

What's the contribution of each of the following actions in saving energy (1 very low, 2 low, 3 fair, 4 high, 5 very high)	Ex ante questionnaire average	Ex post questionnaire average
Turning off light when nobody is in a room	3,87	3,77
Reducing heating	3,21	3,36
Switching off TV when nobody is watching it	3,69	3,49
Reducing cooling	3,23	3,24
Using low consumption light bulbs	3,39	3,69
Switching off stand by mode of electric appliances	2,95	3,23
Choosing energy efficient appliances	3,34	4,23
Making a shower in spite of a bath	3,77	3,59
Driving the car in a environmental friendly way	3,39	3,38
Moving by foot or bike whenever possible	3,75	3,69
Buying local food	3,11	3,34

Add your comments, in particular the use of the IUSES tool kit had some impact on students perception of energy consumption?

The data collected show that the results of the 'ante' and 'post' questionnaires are similar. This does not allow to evaluate precisely the impact of the IUSES tool kit on students' perception of energy consumption

1.3 Students energy behaviour

How do you go to school?	Ex ante questionnaire %	Ex post questionnaire
By foot or bicycle	16,90	25,00
By public transport	59,00	38,7
By motorbike	3,60	0,00
By car	13,30	31,80
Using car sharing	7,20	4,50

Which of the following actions are you doing in your everyday life to save energy (you can choose more than one answer):	Ex ante questionnaire %	Ex post questionnaire %
Turning off light when I'm not in a room	97,4	95,74
Reducing heating	16,88	34,04
Switching off TV when nobody is watching it	87,01	72,34
Reducing cooling	15,58	14,89
Using low consumption light bulbs	57,14	59,57
Switching off stand by mode of electric appliances	27,27	36,17
Choosing energy efficient appliances	12,99	25,53
Making a shower in spite of a bath	70,13	70,21
Driving the car in a environmental friendly way	6,49	12,77
Moving by foot or bike whenever possible	50,65	59,57
Buying local food	9,09	8,51

Add your comments, in particular the use of the IUSES tool kit had some impact on students behaviour of energy consumption? Did they involve someone else in their energy saving actions?

The data collected show a slight raise in the use of the bicycle to go to school but at the same time a significant raise in the use of the car. Our team thinks that this is merely a coincidence and that the IUSES tool kit has anyway positively contributed to improve students behaviours and actions in the energy saving field.

1.4 Students & IUSES

Please evaluate IUSES handbooks giving a score according to the following scale :1 (very poor), 2 (poor), 3 (fair), 4 (good) 5 (very good):	**Average**
Buildings handbook:	
Clearness	2,88
Usefulness of tips and hints for everyday life	3,33
Usefulness of contents for my future studies/job	2,85
Transport handbook:	
Clearness	3,27
Usefulness of tips and hints for everyday life	3,09
Usefulness of contents for my future studies/job	3,03
Industry handbook	
Clearness	3,06
Usefulness of contents for my future studies/job	3,06

Please indicate your agreement with the following statements (1 strongly disagree, 2 disagree, 3 neither agree nor disagree, 4 agree, 5 strongly agree):	**Average**
a) The IUSES experiments kit helped me in understanding the contents of the lessons.	2,90
b) The multimedia DVD helped me in understanding the contents of the lessons.	3,42

Where did you use the multimedia DVD?	**%**
At school	35,34
At home	50,00
At school and at home	14,66

Please add your comments: what's the overall evaluation of the tool kit by the students?

The average age of the students is 16 years old. The questionnaire was filled in by 52 male and 48 female. The majority of the students involved come from linguistic, art and technical schools. The data show a small increase in students' knowledge on energy efficiency and in their behaviours after using the IUSES tool kit. The students found IUSES tool kit clear and useful and they have used it both at school and at home.

Is any national cultural or educational element influencing the answers? Does age, gender or type of school have an impact on the answers provided?

2 Teachers feedback

2.1 Teachers details

Number of teachers who filled in the questionnaires: 24

Average age: 42,29 years

Gender	**%**
Male	62,50
Female	37,50

Type of school	**%**
technical	35,00
scientific	0,00
business	0.00
languages/art	65,00

Which subject are you teaching:	**%**
Technology	0,00
Biology, chemistry	15,40
Physics	19,20
Math	15,40
Literature, history, philosophy	3,80
Foreign language	0,00
Art	0,00
Other (specify)	46,20

In the above table include also answers from question 6

2.2 Teaching Energy Efficiency using IUSES tool kit

Number of hours devoted to teaching energy efficiency: 210 (average 12,77 hours per school)

Number of students trained using IUSES tool kit: 1431

Before using IUSES educational kit were you already teaching energy efficiency in your lessons?

No	30,00
Yes, but in a smaller number of hours	40,00
Yes, in the same number of hours	30,00

Please indicate your agreement with the following statements (1 strongly disagree, 2 disagree, 3 neither agree nor disagree, 4 agree, 5 strongly agree)

	Average
IUSES Teachers' guidebook helps teachers in preparing their lessons	3,65
IUSES Teachers' guidebook gives useful information in setting up an energy saving plan	3,81

Please summarize teachers comments on the question and in case add you comments

The figures show that the teacher guidebook was helpful for preparing lessons and setting up an energy saving plan. A significant number of teachers was already been teaching about energy before their participation in the IUSES project, but more than half of them was used to dedicate to the topic a smaller number of hours. So we can affirm that the IUSES tool kit has encouraged teachers to spend more hours of lessons on energy efficiency.

Please evaluate IUSES handbooks giving a score according to the following scale :1 (very poor), 2 (poor), 3 (fair), 4 (good) 5 (very good):

	Average
Buildings handbook:	
Clearness	3,82
Usefulness of tips and hints for everyday life	4,06
Usefulness of contents for my future studies/job	4,06
Transport handbook:	
Clearness	3,81
Usefulness of tips and hints for everyday life	4,06
Usefulness of contents for my future studies/job	3,94
Industry handbook	
Clearness	3,73
Usefulness of contents for my future studies/job	3,60

Please indicate your agreement with the following statements (1 strongly disagree, 2 disagree, 3 neither agree nor disagree, 4 agree, 5 strongly agree):

	Average
IUSES experimental tool kit helps students in understanding the contents of the lessons.	3,50
The multimedia DVD helps students in understanding the contents of the lessons	3,89

Where did the students use the multimedia DVD?	**%**
At school	42,86
At home	22,22
At school and at home	44,44

Please summarize teachers comments on the question and in case add you comments

The figures show that teachers find IUSES handbook valid and useful.

How many teachers would suggest other teachers to use IUSES educational kit? (question 18): 21

How many teachers are going to use IUSES educational tool kit next year? (question 19): 24

How many schools are going to implement energy saving plan? (question 20): 10

Summarize briefly details.

The majority of the teachers intends to suggest the IUSES tool kit to other teachers.

All the teachers are going to use the IUSES tool kit next year which is a very good indicator of the usefulness of the educational materials.

3 schools have just stated that they are going to implement energy saving plans, but they did not specify how.

3 schools have described their energy saving plans very broadly (like turning off the lights, efficient heating of the school building, energy saving lamps).

3 schools have stated that they will do energy bookkeeping and energy audit, which shows credible energy saving plans;

1 schools has stated that they will probably install solar modules and change the windows of the school.

2 schools have included ‘awareness raising campaigns’ in their energy saving plan and one of 10 schools has mentioned a mobility plan.

Summarize final suggestions (question 21) and add your comments.

Only 1 teacher has answered to this question, and his reply is following:

“I would like to commend the tool box. Even if there are some things still missing in the box, with a little effort a teacher can do excellent experimental exercises. Our school is participating in a pilot project on energy and we are going to publish a teachers handbook..” From this declaration it seems that this school will use the IUSES materials to make its own teachers’ handbook. This would be a very good dissemination effect, as the use of the project educational material would be extended to all the teachers of that school.

Apart form the questionnaires, Slovenski E-forum has gathered from the teachers some oral comments. Some teachers found the handbook complex , others very simple, but this is normal as it depends from the type of school and from the class involved. Other teachers complained that they would have preferred to be guided step by step in the project phases. Many others found the handbooks and the box very useful.

Is the type of school, subjects taught, age or gender of teachers influencing the answers provided by teachers?

2.3 Teachers behaviour

Going to school:	A year ago (%)	After using IUSES tool kit
By foot or bicycle	26,90	24,10
By public transport	3,80	6,90
By motorbike	3,80	3,40
By car	65,40	65,50
By car sharing	0,00	0,00

Which of the following actions have you begun to do after teaching energy efficiency in your everyday life to save energy (multiple answer possible):	%
Turning off light when I'm not in a room	12,10
Reducing heating	9,70
Switching off TV when nobody is watching it	13,70
Reducing cooling	3,20
Using low consumption light bulbs	13,70
Switching off stand by mode of electric appliances	9,70
Choosing energy efficient appliances	6,50
Making a shower in spite of a bath	12,10
Driving the car in a environmental friendly way	5,60
Moving by foot or bike whenever possible	8,10
Buying local food	5,60

Is teachers' behaviour energy efficient? Did IUSES have an impact on their behaviour? Make your comments.

After their participation to the IUSES project many teachers still continue to do some actions not in an energy efficient way, for example most of them still use the car to go to the school. However an encouraging fact is that 25% of them goes to school by bicycle or by foot.

Turning off the light, TV, using low energy saving light bulbs and taking shower instead of bath are the 4 most respected energy saving measures by teachers. On the other hand, reducing cooling, buying local food and driving the car in environmentally friendly way, are the 3 less implemented actions.

3 Conclusions

Compare teachers and students answers? Are they coherent? Is any significant difference?

Teacher has given to the IUSES tool kit a slight higher mark than the students, but they both find it quite good.

Teachers and students have chosen similar energy saving actions as the most efficient. These are: turning off the light and the television, using low energy saving light bulbs and taking a shower instead of a bath. Students have added also moving by foot or by bicycle whenever possible.

What's the lesson learnt?

The testing phase should last more and done in one single phase and not two.

What worked best?

The box seems to be the most appreciated tool, although some teachers thought it was not so appropriate for secondary schools.

Students and teachers seem to have liked the games. Only one teacher said that the games were too easy and they did not contribute to the students' creativity.

It is important to mention that some of the teachers found the handbooks very useful.

What should be improved?

Handbooks could be divided in two groups: for technical and non technical schools.

Report on testing activities in SPAIN

CIRCE - Centro de Investigación de Recursos y Consumos Energéticos

Author: Giuseppe Pugliese

0 Introduction

Schools involved: 24
Number of filled in questionnaires by students: 225
Number of filled in questionnaires by teachers: 10
Timeframe in which testing occurred: November 2009 – May 2010
Even if 24 schools and 34 teachers were involved in the testing phase (course for teachers, monitoring and questionnaires), questionnaires have been filled in by 10 teachers from 14 schools. In addition, CIRCE's trainers and project responsible have obtained feedbacks by the other teachers through emails, visits to the schools involved and an open debate during the last day course in April 2010.

1 Students feedback

1.1 Students details

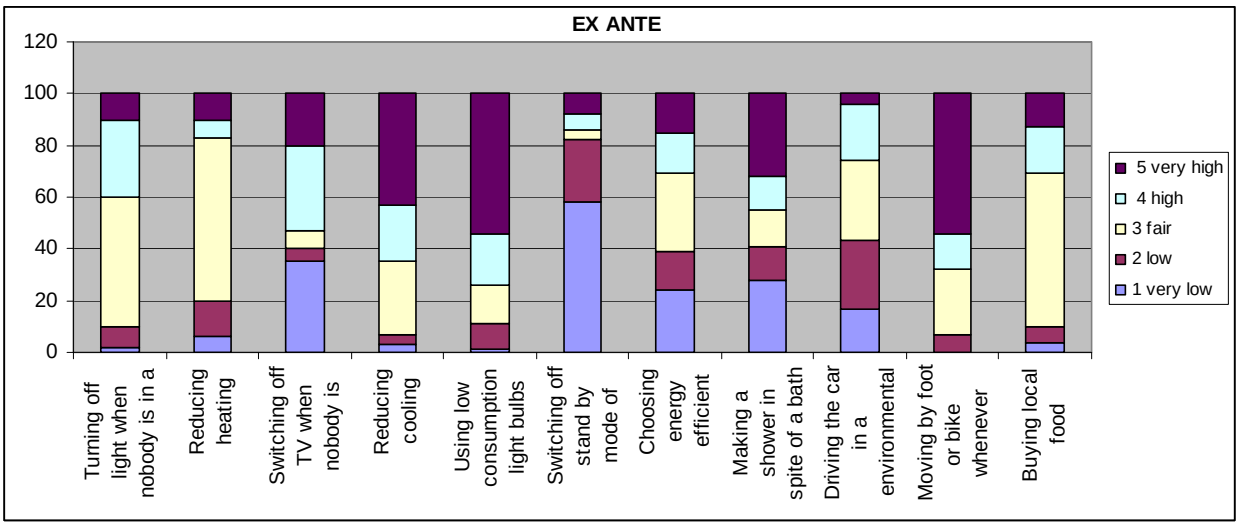
Age	**%**
13	12,89
14	21,78
15	32,00
16	25,78
17	20,44
18	0
Average age	**15,3**

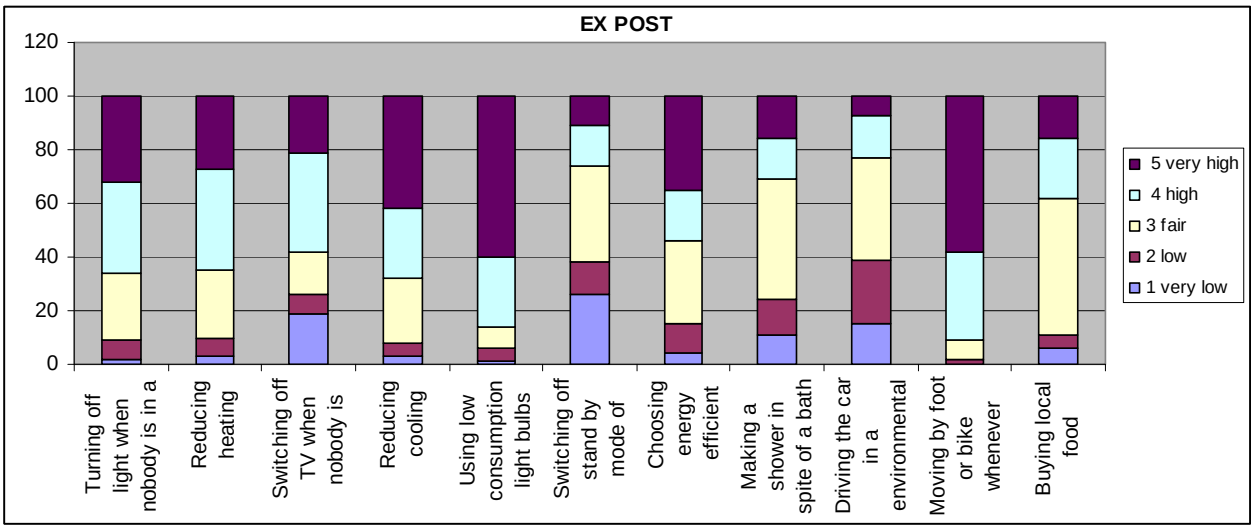
Gender	**%**
Male	56
Female	44

Type of school	**%**
technical	0
scientific	0
business	0
languages/art	0
Generalist	100

1.2 Perception of energy consumption

What's the contribution of each of the following actions in saving energy (1 very low, 2 low, 3 fair, 4 high, 5 very high)		
	Ex ante questionnaire average	**Ex post questionnaire average**
Turning off light when nobody is in a room	3,38	3,87
Reducing heating	3,01	3,79
Switching off TV when nobody is watching it	2,98	3,34
Reducing cooling	3,98	3,99
Using low consumption light bulbs	4,16	4,39
Switching off stand by mode of electric appliances	1,82	2,73
Choosing energy efficient appliances	2,83	3,7
Making a shower in spite of a bath	3,08	3,12
Driving the car in a environmental friendly way	2,7	2,76
Moving by foot or bike whenever possible	4,15	4,47
Buying local food	3,3	3,37



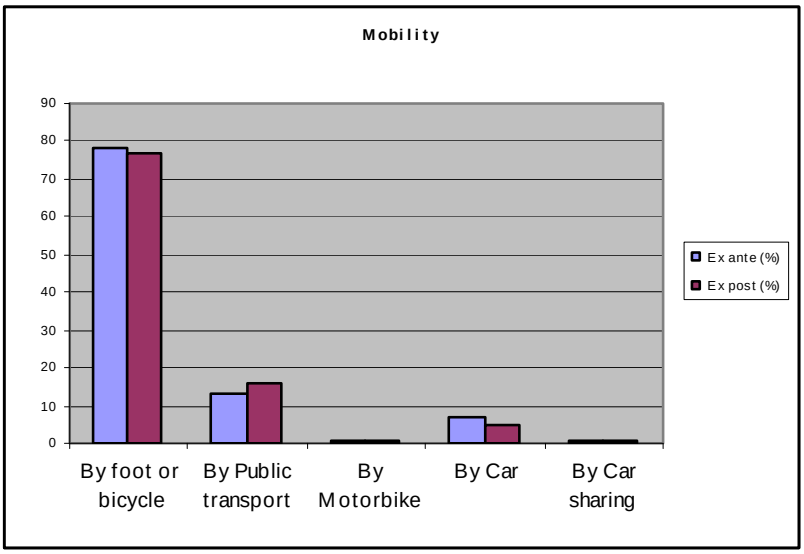


Students have improved their perception of energy saving in relation to all actions considered in the survey. As figures show, the highest improvements could be noticed for “Switching off stand by mode of electric appliances” and “Choosing energy efficient appliances”. In the IUSES tool kit a special attention is paid on these issues as you can see in the Building Handbook and the in the Excel exercise annexed.

There is no evidence of differences related to gender or age in the answers.

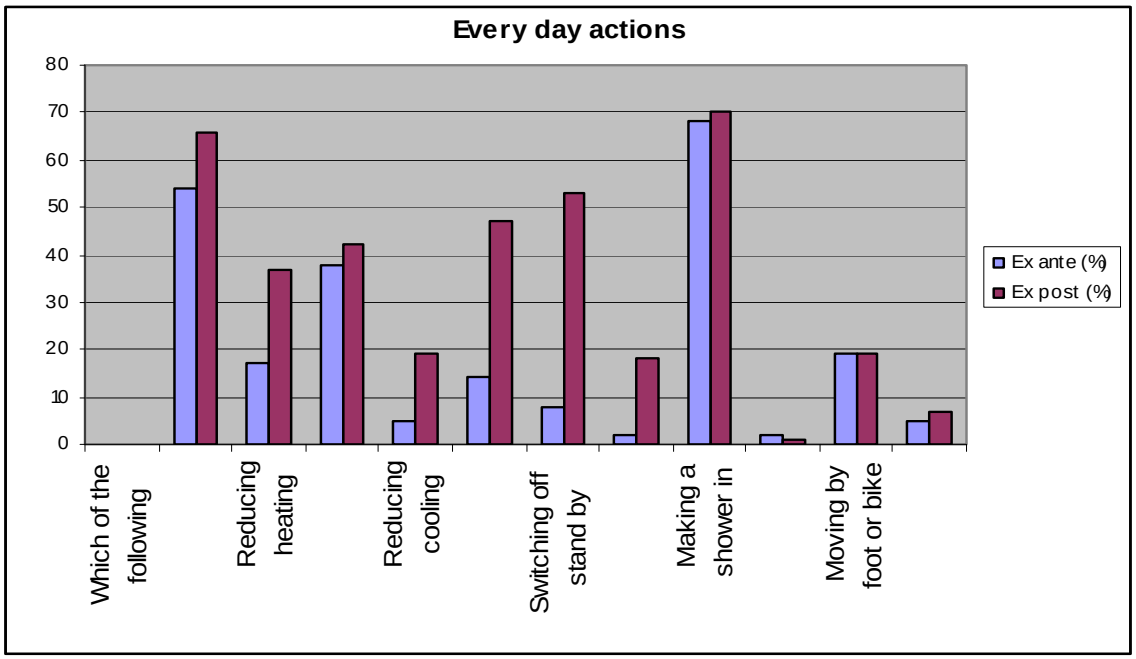
1.3 Students energy behaviour

How do you go to school?	Ex ante questionnaire %	Ex post questionnaire %
By foot or bicycle	78	77
By public transport	13	16
By motorbike	1	1
By car	7	5
Using car sharing	1	1



Which of the following actions are you doing in your everyday life to save energy (you can choose more than one answer):	Ex ante questionnaire %	Ex post questionnaire %
Turning off light when I'm not in a room	54	66
Reducing heating	17	37
Switching off TV when nobody is watching it	38	42
Reducing cooling	5	19

Using low consumption light bulbs	14	47
Switching off stand by mode of electric appliances	8	53
Choosing energy efficient appliances	2	18
Making a shower in spite of a bath	68	70
Driving the car in a environmental friendly way	2	1
Moving by foot or bike whenever possible	19	19
Buying local food	5	7



The IUSES tool kit has not substantially changed student mobility behaviours, as they were already quite “sustainable”. Nevertheless, it seems that significant improvements have been done in relation with everyday life actions, especially: “reducing heating”, “Using low consumption light bulbs” and “Switching off stand by mode of electric appliances”. This is in accordance with the answers in section 1.2 and with the IUSES “building handbook” contents.

1.4 Students & IUSES

Please evaluate IUSES handbooks giving a score according to the following scale :1 (very poor), 2 (poor), 3 (fair), 4 (good) 5 (very good):	**Average**
Buildings handbook:	
Clearness	5
Usefulness of tips and hints for everyday life	4
Usefulness of contents for my future studies/job	4
Transport handbook:	
Clearness	4
Usefulness of tips and hints for everyday life	4
Usefulness of contents for my future studies/job	3
Industry handbook	
Clearness	3
Usefulness of contents for my future studies/job	3

Please indicate your agreement with the following statements (1 strongly disagree, 2 disagree, 3 neither agree nor disagree, 4 agree, 5 strongly agree):	Average
a) The IUSES experiments kit helped me in understanding the contents of the lessons.	4
b) The multimedia DVD helped me in understanding the contents of the lessons.	4

Where did you use the multimedia DVD?	%
At school	16
At home	54
At school and at home	30

Students have well appreciated the IUSES tool kit, even if the handbooks were considered too long. Nevertheless, the power points presentations, the exercises included in the handbooks and annexed calculation sheet exercises have been considered very useful tools to support and get practice with the handbooks. Students also find attractive the DVD multimedia and the experiment kit.

Students' evaluation of the tool kit changes a little bit depending on the educational subject in which the didactic material has been used, so the evaluation were also influenced by teachers' way to use the materials. Students attending technical schools found the contents of the handbooks quite easy while it was not the same for students attending other kind of schools. Thus, it would be advisable for teachers to select contents from IUSES materials according to the contest and the knowledge and skills of the students.

2 Teachers feedback

2.1 Teachers details

General data about teachers: **10 teachers have filled in the questionnaire**

Average age: **42,8**

Gender: **Male = 70%, Female = 30%**

Type of school	**%**
technical	20
scientific	
business	
languages/art	
Generalist	80

Which subject are you teaching:	**%**
Technology	50
Biology, chemistry	40
Physics	
Math	
Literature, history, philosophy	10
Foreign language	
Art	
Other (specify)	

In some schools teachers of different subjects have collaborated together by sharing the handbook contents, i.e. language, technology, natural science and maths. Since the group of students was the same, it outcame in a coherent and very successful results.

2.2 Teaching Energy Efficiency using IUSES toolkit

Number of hours devoted to teaching energy efficiency: 163 total hours with an average of 16,3 per teacher.

Number of students trained using IUSES toolkit: 449 students trained by the 10 teachers polled. However, the total amount of teachers that took part to the IUSES testing activities is 34 and the total number of students trained is approximately 800 .

Before using IUSES educational kit were you already teaching energy efficiency in your lessons?	**%**
No	
Yes, but in a smaller number of hours	70
Yes, in the same number of hours	30

Please indicate your agreement with the following statements (1 strongly disagree, 2 disagree, 3 neither agree nor disagree, 4 agree, 5 strongly agree)	**Average**
IUSES Teachers guidebook helps teachers in preparing their lessons	3,9
IUSES Teachers guidebook gives useful information in setting up an energy saving plan	4,2

Teachers highlighted the need for more ideas to develop practically the works with students. Moreover some layout aspects of the handbooks could be improved.

Part of the teachers preferred to follow their own criteria to teach the lessons, strictly in accord to the curricula imposed by the national and school rules. Anyway the IUSES educational kit has boosted energy activities in schools by supplying updated contents and new support tools to the teachers.

Please evaluate IUSES handbooks giving a score according to the following scale :1 (very poor), 2 (poor), 3 (fair), 4 (good) 5 (very good):	**Average**
Buildings handbook:	
Clearness	4,1
Usefulness of tips and hints for everyday life	4,2
Usefulness of contents for my future studies/job	3,7
Transport handbook:	
Clearness	3,9
Usefulness of tips and hints for everyday life	4,2
Usefulness of contents for my future studies/job	3,7
Industry handbook	
Clearness	3,6
Usefulness of contents for my future studies/job	4,1

The only complaint made by the teachers is that the handbooks are a little bit extensive in term of pages. The “Building handbook” is slightly preferred up the others, probably because it is closer to the everyday life application and it contains more figures and pictures. Anyway the three handbooks have been evaluated almost with the same score that is approximately 4.

Please indicate your agreement with the following statements (1 strongly disagree, 2 disagree, 3 neither agree nor disagree, 4 agree, 5 strongly agree):	Average
IUSES experiments kit help students in understanding the contents of the lessons.	4,1
The multimedia DVD help students in understanding the contents of the lessons	4

Where did the students use the multimedia DVD?	%
At school	10
At home	10
At school and at home	80

All teachers interviewed declared that they would suggest it to other colleagues.

9 out 10 teachers are going to use educational toolkit next year

5 out 10 teachers are going to implement an energy saving plans in their schools. Teachers answering no, are motivating their answer with the difficulty to work together with many other teachers, to reach a common agreement and to find out the necessary time to do it.

All teachers want to continue such kind of activities for the next year and they consider very useful having participated to the training course and having received didactic material that will help them in their work.

A common observation made by the teachers was that many barriers against such type of energy actions comes from school managers and/or educational authorities, who have decisional power and financial availability.

The subjects which have been taught with a particular stress during the school-year are corresponding to the more appreciated contents of the handbooks. According to the gender, female teachers seemed to evaluate more positively the IUSES didactical material than their colleagues.

2.3 Teachers behaviour

Going to school:	A year ago (%)	After using IUSES toolkit
By foot or bicycle	40	40
By public transport	20	30
By motorbike	0	0
By car	30	10
By car sharing	10	20

Which of the following actions have you begun to do after teaching energy efficiency in your everyday life to save energy (multiple answer possible):	%
Turning off light when I'm not in a room	50
Reducing heating	50
Switching off TV when nobody is watching it	50
Reducing cooling	30
Using low consumption light bulbs	60
Switching off stand by mode of electric appliances	70
Choosing energy efficient appliances	50
Making a shower in spite of a bath	30
Driving the car in a environmental friendly way	30
Moving by foot or bike whenever possible	50
Buying local food	40

Teachers seems to be quite energy efficient and many of them have declared that after their participation to IUSES, now they pay more attention to some aspects they previously not considered, first of all "Switching off stand by mode of electric appliances".

3. Conclusions

The comparison between the two groups of answers shows interesting coherences. First of all both students and teachers have performed the same energy behaviour changes, such as “Reducing heating”, “Using low consumption light bulbs” and “Switching off stand by mode of electric appliances”, “Choosing energy efficient appliances”. In the same way, both of them found the IUSES materials very helpful even if the handbooks are considered a little bit too long.

Mainly teachers found useful the power point presentations to support their lessons and the excel templates to make exercises and set up an energy saving plan at school. Also the experimental kit was considered very useful, but the low number of pieces supplied generated some isolated complains.

One of the lessons learnt is that one year of project activities is quite a short time to develop the whole pack of actions proposed. Continuity and more support to schools are needed in the next years, in order to obtain a visible impact. In general, schools’ administrations lack of flexibility in taking decisions and starting new projects. The uptake of changes is quite slow, in many cases they cannot neither regulate the thermostats. So it is very difficult to carry out technical actions in facilities, as for example to substitute weather-stripping.

Anyway, IUSES works as a very good start up that need continuity for the next years. Teachers and school staffs that have shown more awareness and willingness will doubtless continue on the IUSES track next year.