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# REPORT

**on the conducted survey on energy efficiency in  
primary and secondary schools in the City of Niš**

<i>The research carried by:</i>	<b>Center for Energy Efficiency, Niš</b>
<i>Fieldwork :</i>	<b>June 2014</b>
<i>Type and sample size :</i>	<b>Representative sample of 317 pupils - 236 primary and 81 secondary school pupils</b>
<i>The sampling frame :</i>	<b>Primary and secondary schools in the City of Niš</b>
<i>Surveyed schools :</i>	<b>Systematic sampling - primary and secondary schools in urban and rural areas</b>
<i>Research technique :</i>	<b>The survey questionnaire on paper</b>

**Niš, August 2014.**

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Center for Energy Efficiency (CEE) conducted during the June 2014, an anonymous survey for pupils in primary and secondary schools in the City of Niš, in order to examine the knowledge, habits and attitudes of young people in relation to energy efficiency, for the project entitled „**Energy efficient schools - our children deserve that**“ 2007CB16IPO006-2011-2-78.

The survey included 317 pupils, 236 pupils in primary schools and 81 pupils in secondary schools in 6 schools in the City of Niš:

- Primary schools:
  - „Ivo Andric“ Niš, Branka Bjegovića bb
  - „Lela Popovic“ Miljkovac bb
  - „Milan Rakic“ Medosevac, Dimitrija Tucovica 50
  - „Vuk Karadzic“ Niš, Beogradska 2
- Secondary schools:
  - Technical school „12. februar“ Nis, Beogradska 22
  - Mechanical technical school „15. maj“ Nis, Beogradska 22

The survey was conducted in the presence of the teaching staff, after receiving approval from school principals.

The collected data were tabulated formatted for statistical processing and simpler presentation of the results.

The total sample set includes 317 pupils, out of which 236 pupils from primary and 81 from secondary schools, as shown in Table 1 and Table 2.

Table 1. Number of surveyed pupils in primary schools

	School	Number of respondents
1.	„Ivo Andric“	50
2.	„Lela Popovic“	33
3.	„Milan Rakic“	70
4.	„Vuk Karadzic“	83
Total:		236

Table 2. Number of surveyed pupils in secondary schools

	School	Number of respondents
1.	Technical school „12. februar“	20
2.	Mechanical technical school „15. maj“	61
Total:		81



## The structure of the responses to the questions in the survey

Responses are shown for primary and secondary schools separately in order to identify potential differences in age and level of knowledge. Lack of response to a specific question is marked with "-".

### 1. Do you know the meaning of the term "energy efficiency"?

- a. *Yes, in full*
- b. *I heard it, but I am not sure what it means*
- c. *I have never heard*

Overall, 29% of pupils claim to know exactly what it is energy efficiency, while 61% are uncertain. Also other responses of primary and secondary school pupils are similar, ie. not show a statistically significant difference.

*The results of this question indicate that the respondents are not sufficiently familiar with the concept of energy efficiency, and this lack of information shows that they are not able to decide which answer to choose.*

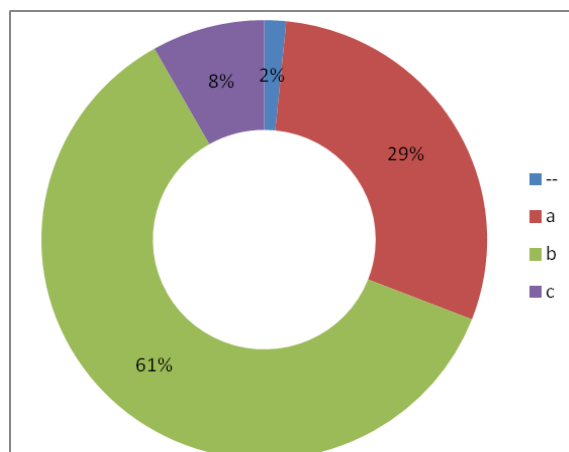


Figure 1. What is the „energy efficiency“

Table 3. The structure of pupil responses on the meaning of the term "energy efficiency"

		Terms meaning				Total:
		--	a	b	c	
school	primary	5	68	139	24	236
	secondary	0	25	54	2	81
Total:		5	93	193	26	317

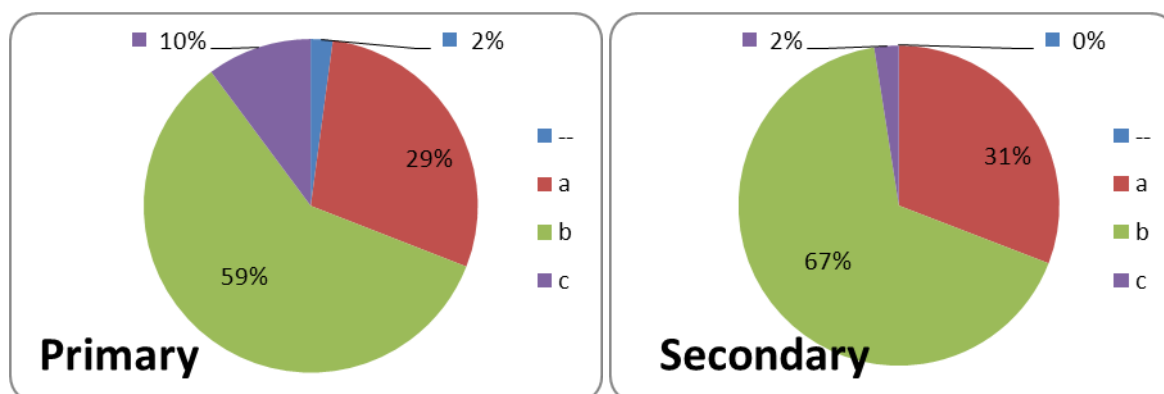


Figure 2. Comparative analysis of the responses of primary and secondary school pupils



**2. Is it for you energy efficiency important?**

- a. *Yes, it is very important*
- b. *Mostly important*
- c. *Not at all important*

Table 4. Personal opinion on energy efficiency

		Is EE personally important				Total:
		--	a	b	c	
school	primary	3	113	106	14	236
	secondary	0	36	44	1	81
Total:		3	149	150	15	317

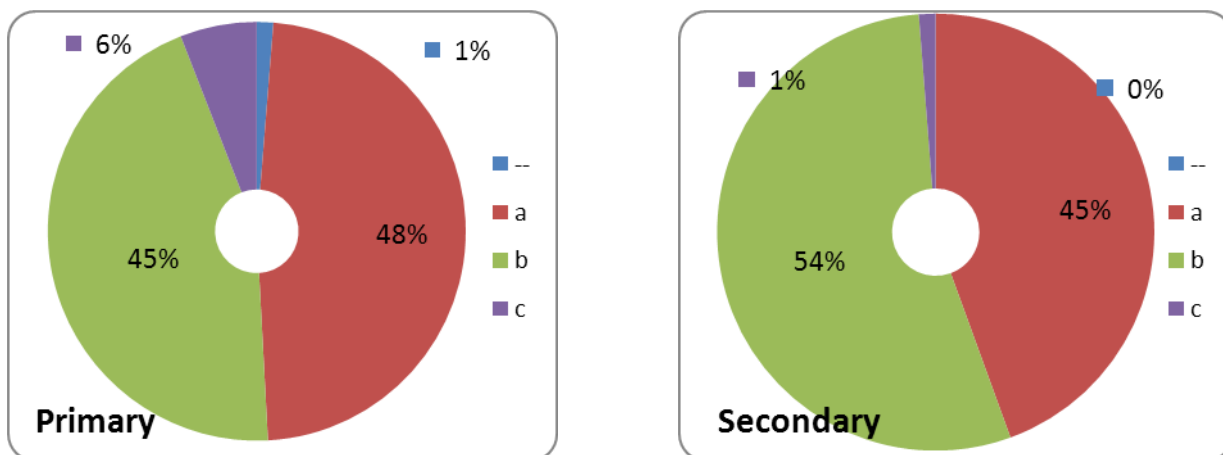


Figure 3. Opinion on energy efficiency

The obtained results show that energy efficiency is important subjects for the most respondents.

**3. Did energy efficiency is the topic of a some school subject?**

- a. *Yes, subject.....*
- b. *No*

Table 5. Does the school subjects dealing with energy efficiency?

		Whether some subject concern EE			Total:
		--	a	b	
school	primary	6	114	116	236
	secondary	4	28	49	81
Total:		10	142	165	317

Lack of awareness of the respondents showed that they could not decide which answer to select.



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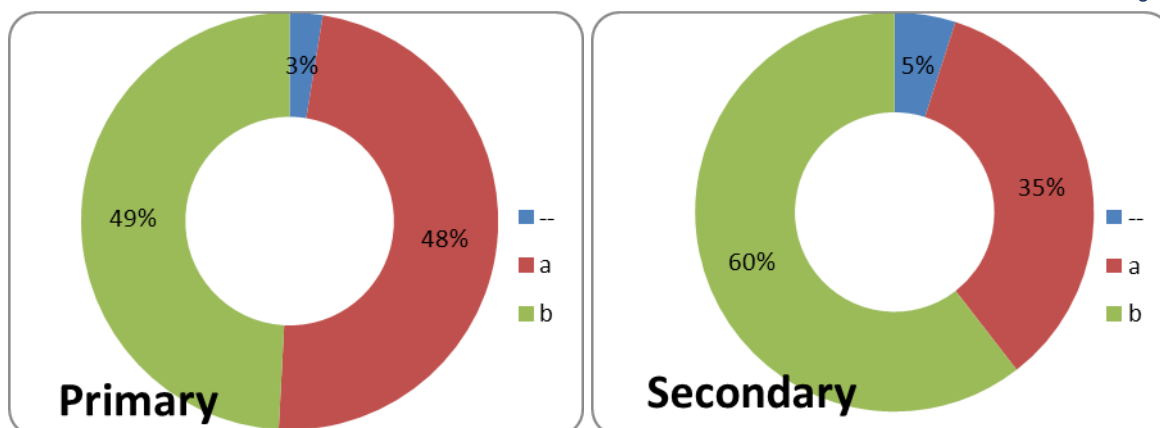


Figure 4. The most of the secondary school pupils think that no school subject deals with EE

**4. Is the energy efficiency associated with environmental protection?**

- a. Yes, related to
- b. No, not related

Table 6. Correlation between energy efficiency and environmental protection

	Is EE connected whit the EP			Total:
	--	a	b	
school primary	8	195	33	236
secondary	0	69	12	81
Total:	8	264	45	317

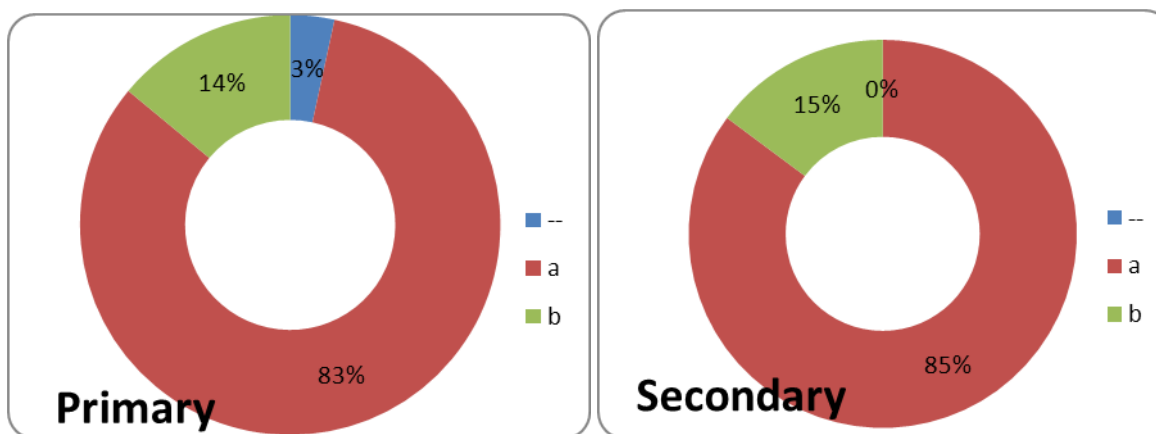


Figure 5. Connection between energy efficiency and environmental protection

*The results show a high degree of belief of the respondents that the energy efficiency is associated with environmental protection. This suggests that respondents understand the ecological principles, but with lack of accurate information.*



**5. Rank the following energy efficiency measures for effects on energy saving (6 - the most, with 1 - the least)**

- a. Heating facilities.....
- b. Good carpentry.....
- c. Using energy efficient appliances.....
- d. Using efficient boilers (burners).....
- e. Using energy saving bulbs.....

Table 7. Subjective assessment of the savings made by energy efficiency measures

Score	A	B	C	D	E
1	51	37	28	30	27
2	14	28	26	43	16
3	34	36	38	27	18
4	25	31	43	37	13
5	42	28	21	24	26
6	54	39	43	32	53

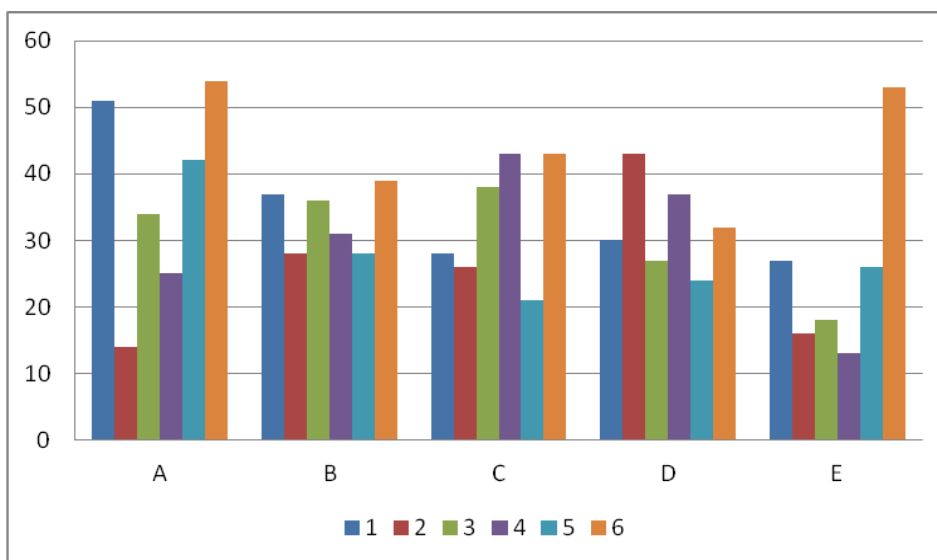


Figure 6. Ranking of energy efficiency measures to the effects on the energy-saving

Obtained results indicate the importance of each category of energy efficiency. Respondents in terms of the most important measures are rather uncertain. Additional information is needed to summarize their knowledge and clarify information which receives from various sources.

**6. Do you pay attention to energy saving?**

- a. Yes, I take care
- b. No, I do not take care
- c. Rarely



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Table 8. How much pupils care about saving energy

		Do you save energy				Total:
		--	a	b	c	
school	primary	3	138	23	72	236
	secondary	0	50	9	22	81
Total:		3	188	32	94	317

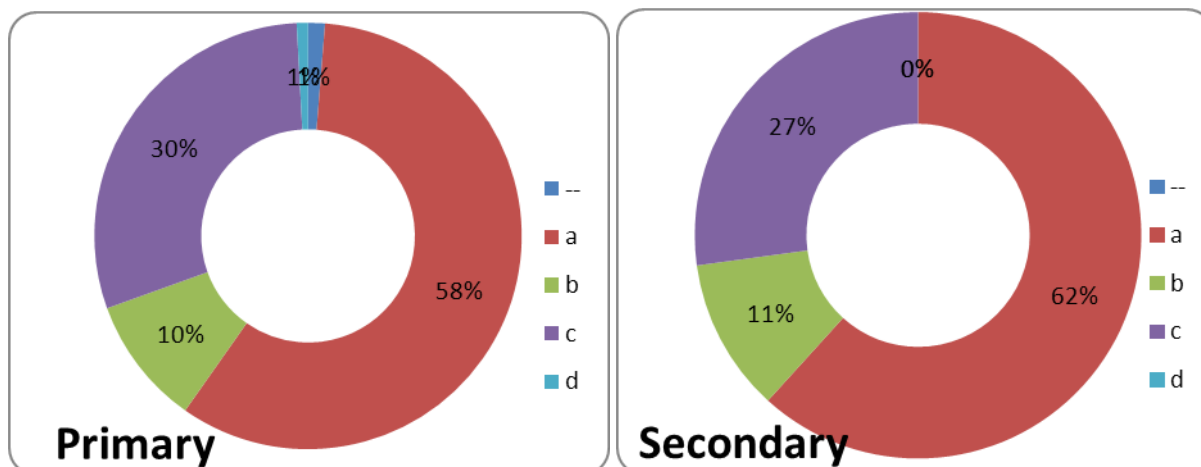


Figure 7. Did the pupils take care of saving energy? (approximately the same ratio of primary and secondary school pupils)

*There is a high degree of awareness about energy savings. It is recommended that participants inform every day on energy savings, which will lead to even higher percentage of respondents who care about energy.*

**7. Have you ever heard about energy saving light bulbs?**

- a. Yes, before I heard the term
- b. No, I have never heard

Table 9. The answer to the question of whether they know about energy saving light bulbs

		You have heard of bulbs			Total:
		--	a	b	
school	primary	1	210	23	236
	secondary	0	75	6	81
Total:		1	285	31	317

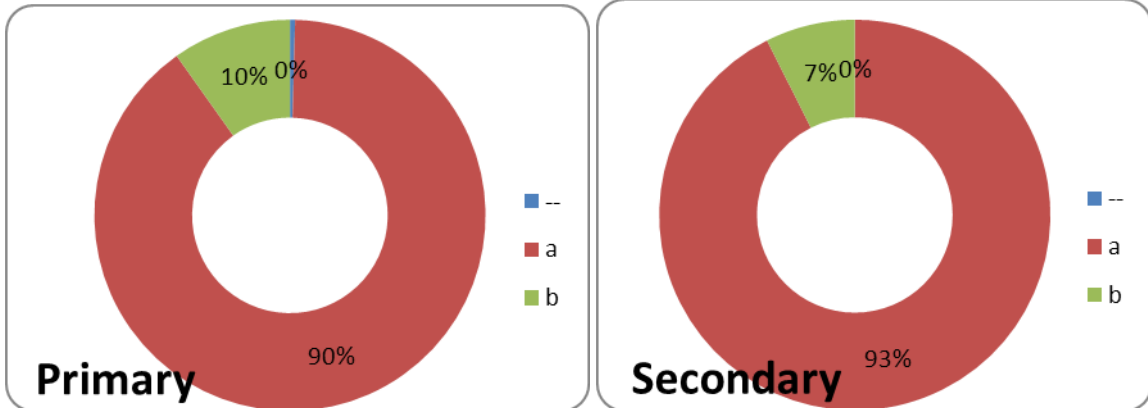


Figure 8. Similar answers, the pupils are familiar with the concept of energy saving light bulbs

*This question shows that respondents are familiar with the concept of energy saving light bulbs as well as the advantage of using these bulbs in terms of energy savings, as well as their longer life.*

**8. Compared with the incandescent bulbs, how much energy consume energy saving light bulbs with the same lighting flux?**

- a. Two times less electrical energy
- b. Four times less electrical energy
- c. Six times less electrical energy

Table 10. How much pupils are informed about the energy savings of lighting bulbs

	How much energy is consumed by energy saving bulbs				Total:
	--	a	b	c	
school primary	6	114	91	25	236
secondary	2	25	37	17	81
Total:	8	139	128	42	317

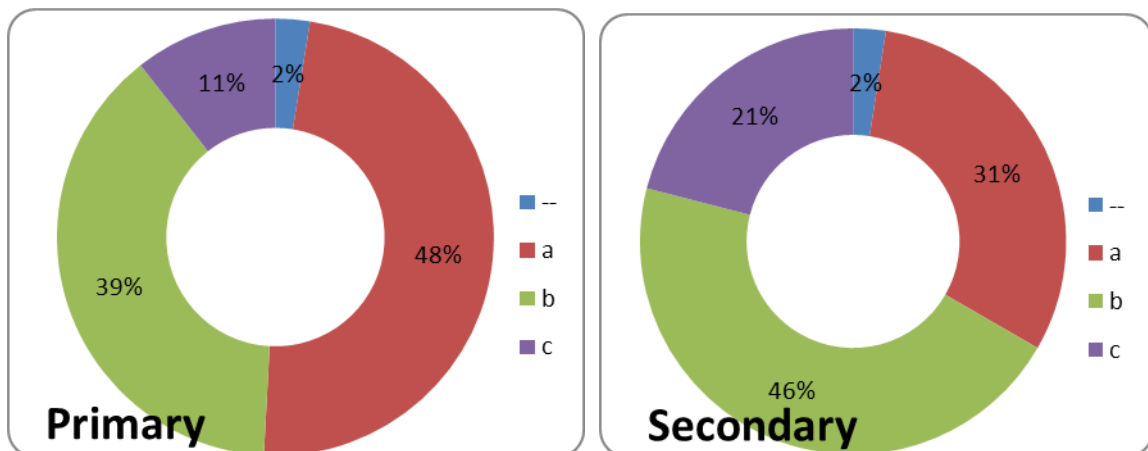


Figure 9. Information about energy saving light bulbs

*These results show the degree of familiarity of respondents with technology and the characteristics of energy saving light bulbs.*





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**9. Lifetime of energy saving light bulbs?**

- a. Same as incandescent bulbs
- b. Eight times longer
- c. Twenty times longer

Table 11. How many pupils know about the life-saving bulbs

		Lifetime of energy saving light bulbs				Total:
		--	a	b	c	
school	primary	3	53	123	57	236
	secondary	3	20	53	5	81
Total:		6	73	176	62	317

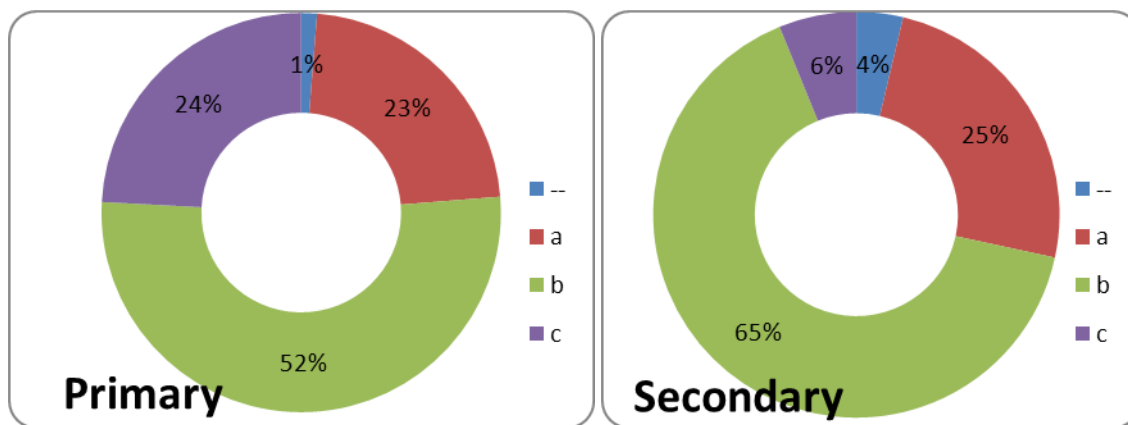


Figure 10. Partially different information about the lifetime of energy saving light bulbs from primary and secondary school pupils

*This question shows that respondents are aware of the advantage of using these bulbs in terms of their longer lifetime.*

**10. What is the main reason for not using energy saving light bulbs?**

- a. I already use
- b. Price, they are still very expensive
- c. Lack of information

Table 12. Why do not you use energy saving light bulbs

		Why not use the energy saving bulbs				Total:
		--	a	b	c	
school	primary	6	110	82	38	236
	secondary	2	31	36	12	81
Total:		8	141	118	50	317



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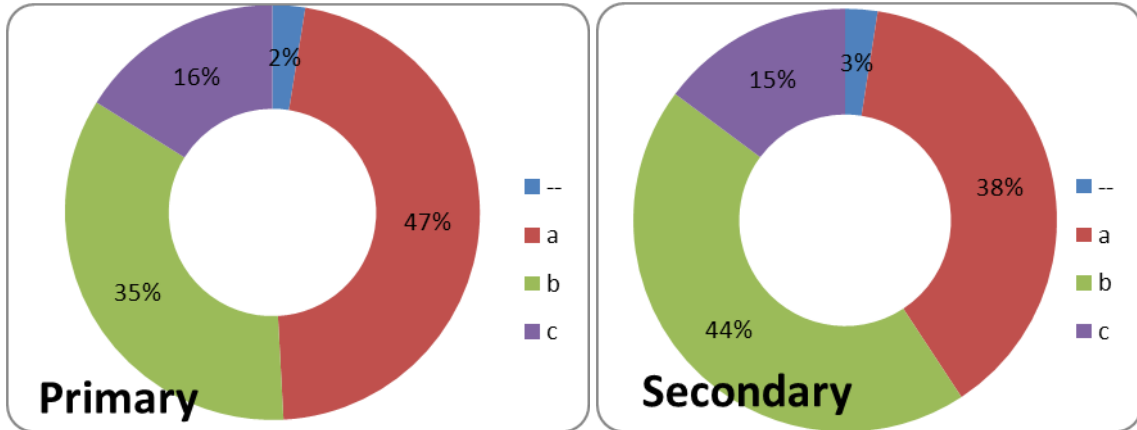


Figure 11. Why do not you use energy saving light bulbs?

These results show the degree of familiarity of respondents with technology and the characteristics of energy saving light bulbs.

**11. In Serbia, the electrical energy is generated mainly from?**

- a. Thermal Power Plants
- b. Hydropower plants
- c. Gas power plants
- d. Renewable plants

Table 13. The electrical energy is generated mainly from?

		The electrical energy is generated mainly from?					Total:
		--	a	b	c	d	
school	primary	11	117	104	12	12	236
	secondary	1	37	42	4	3	81
Total:		12	154	146	16	15	317

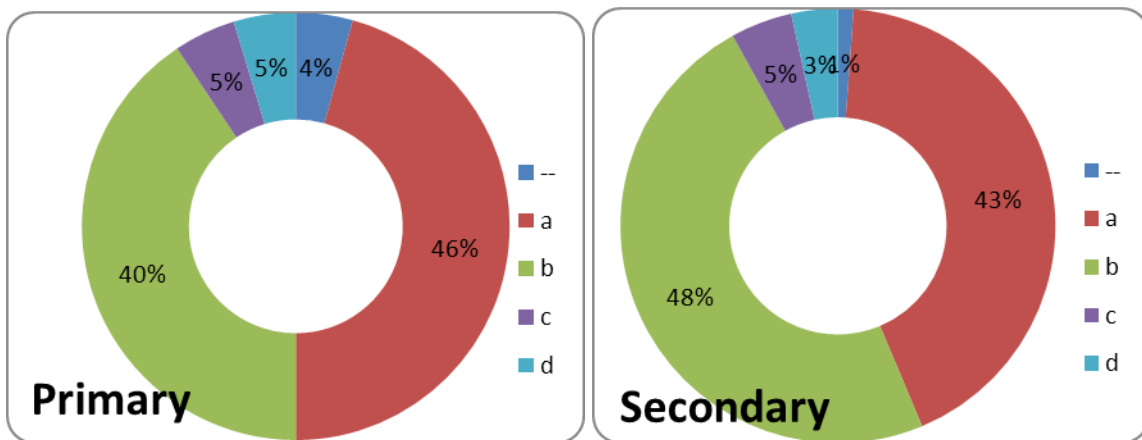


Figure 12. Sources of electrical energy

Obtained results show that the half of total number of pupils have knowledge about the main sources of electrical energy.



**12. I am trying to save energy in my school and home and thus reduce costs?**

- a. Yes
- b. No

Table 14. Do you save energy in the home and school.

		Save energy at home			Total:
		--	a	b	
school	primary	7	167	62	236
	secondary	1	49	31	81
Total:		8	216	93	317

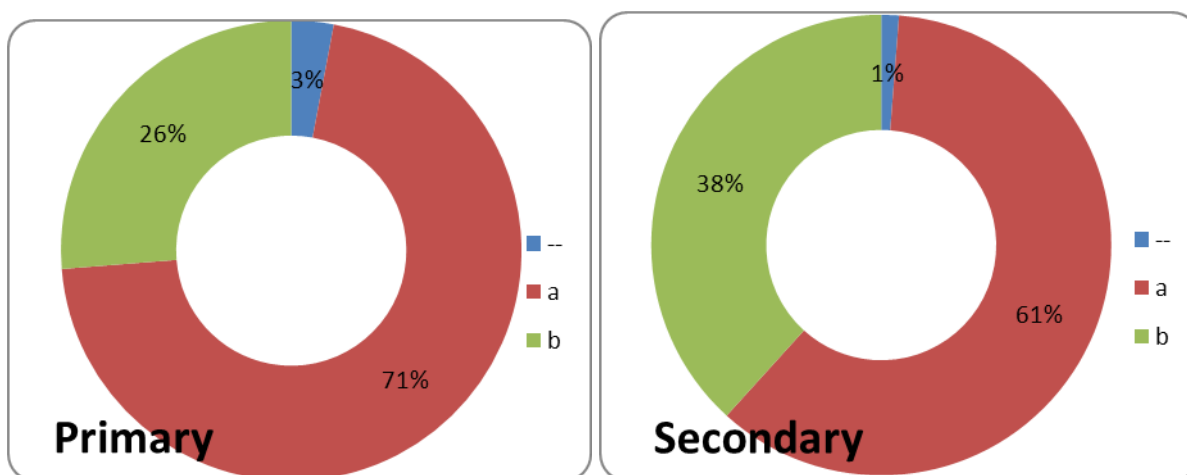


Figure 13. Energy saving

Collected data of the survey clearly shows that the respondents are familiar with the energy saving measures, but they are unsure of their knowledge of energy saving and that they need training and better information on this topic.

**13. Do you know how you can reduce energy costs in your school and home?**

- a. Yes, I know very well
- b. Yes, I think so
- c. No

Table 15. Do you know how to cut energy costs

		Do you know how to cut energy costs				Total:
		--	a	b	c	
school	primary	5	101	106	24	236
	secondary	3	21	49	8	81
Total:		8	122	155	32	317



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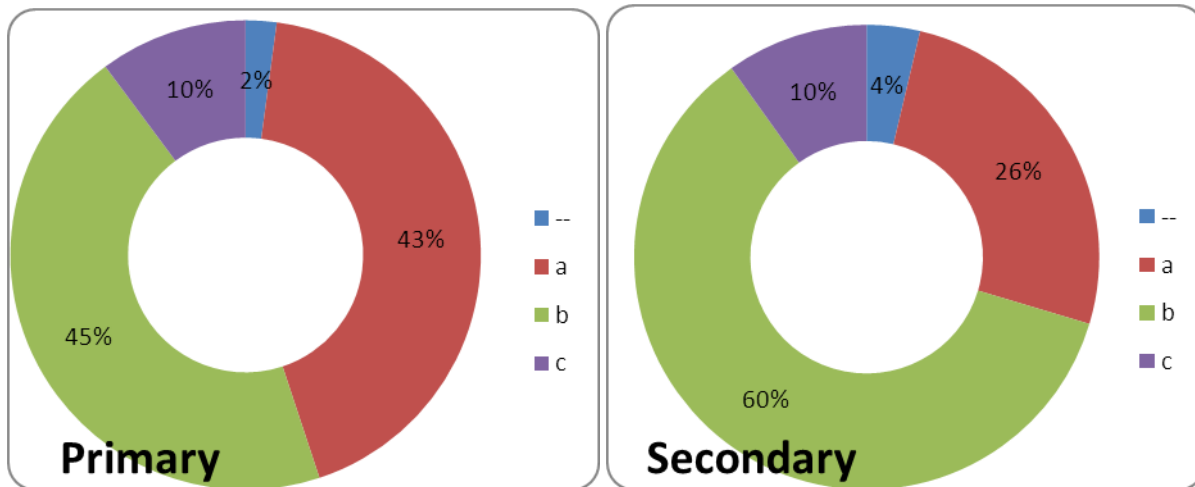


Figure 14. Do you know how to cut energy costs.

This result of the survey clearly shows that the respondents are familiar with the energy saving measures, but they are unsure of their knowledge of energy saving and that they need training and better information on this topic.

**14. Do you think that the energy poor family is who:**

- a. Heat only one room
- b. Unable to pay the huge bill for electrical energy at least one in the winter
- c. Use firewood
- d. Paid heating over 10% of their income
- e. Use lignite

Table 16. What do you think, what makes energy poor family

	What is energy poor families						Total:
	--	a	b	c	d	e	
school primary	10	70	86	32	22	16	236
secondary	2	42	24	9	2	2	81
Total:	12	112	110	41	24	18	317

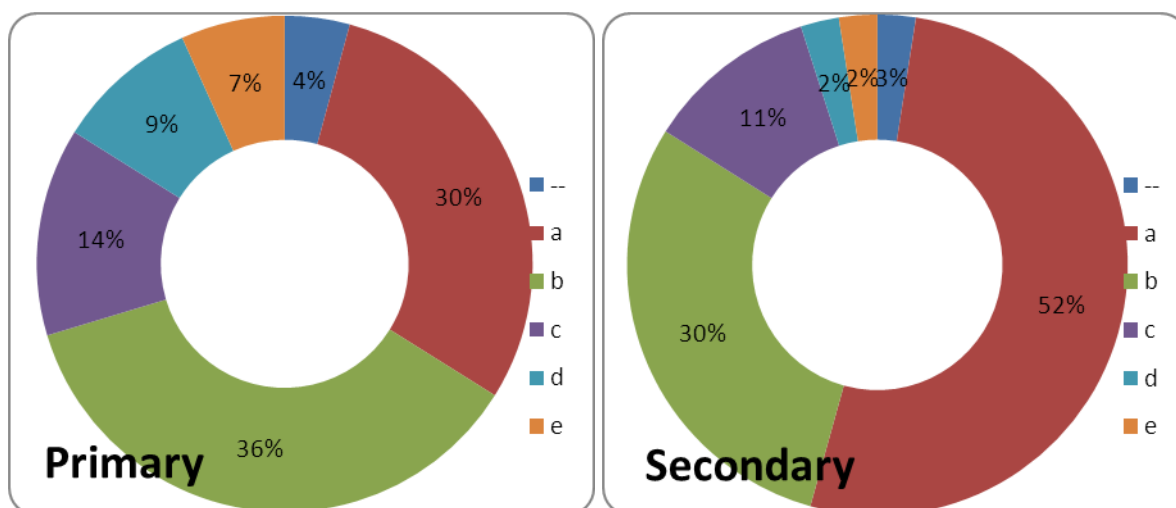


Figure 15. What is an energy poor family



Taking into account all obtained responses, it can be noted that the awareness of respondents about saving electrical energy is developed, but this awareness should continue to develop and direct.

**15. How much, this poll motivated you to save energy in your school and household?**

- a. Before the survey I was not thinking about the saving energy
- b. Before I have been saving energy but now I do it with more attention
- c. The survey did not motivated me to save energy

Table 17. Are you motivated by this poll

		How much this survey stimulate you to energy saving in school and at household				Total:
		--	a	b	c	
school	primary	7	68	115	46	236
	secondary	2	28	27	24	81
Total:		9	96	142	70	317

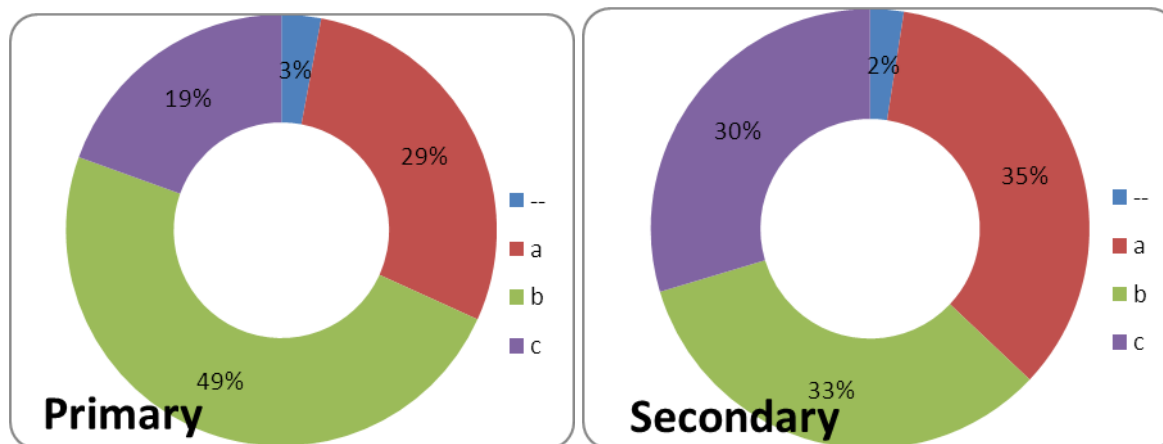


Figure 16. How much this survey stimulate you to energy saving in school and at household

Taking into account all obtained responses, it can be noted that the awareness of respondents about saving electrical energy is developed, but this awareness should continue to develop and direct.

**16. In the future I will continue to saving energy in every possible way?**

- a. Yes
- b. Somewhat
- c. No

Table 18. Will you continue to save energy

		Will you continue to save energy				Total:
		--	a	b	c	
school	primary	6	124	86	20	236
	secondary	2	31	39	9	81
Total:		8	155	125	29	317



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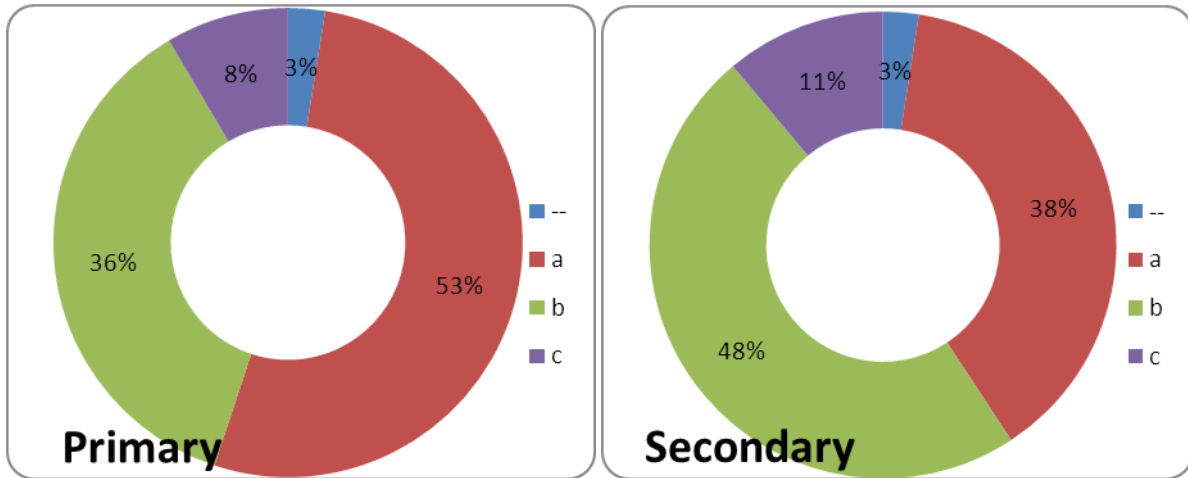


Figure 17. Will you continue to save energy

Taking into account all obtained responses, it can be noted that the awareness of respondents about saving electrical energy is developed, but this awareness should continue to develop and direct.

**17. Do you feel climate changes in yours environment?**

- a. Yes, significantly
- b. Yes, to some extent
- c. No
- d. I am not sure

Table 19. Do you feel climate changes?

	Do you feel climate changes					Total:
	--	a	b	c	d	
school primary	7	91	93	18	27	236
secondary	1	41	27	10	2	81
Total:	8	132	120	28	29	317

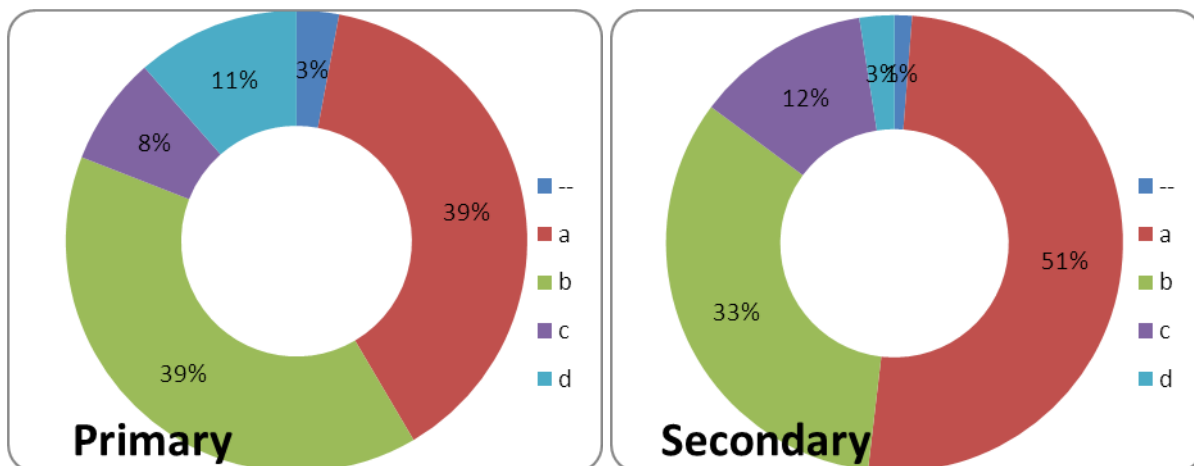


Figure 18. Do you notice the climate changes

Respondents are familiar with this problem.



**18. Do you know what is the energy classes of electrical devices and how to check it?**

- a. Yes
- b. No

Table 20. Awareness of energy classes

		What is the energy class of devices			Total:
		--	a	b	
school	primary	6	64	166	236
	secondary	2	27	52	81
Total:		8	91	218	317

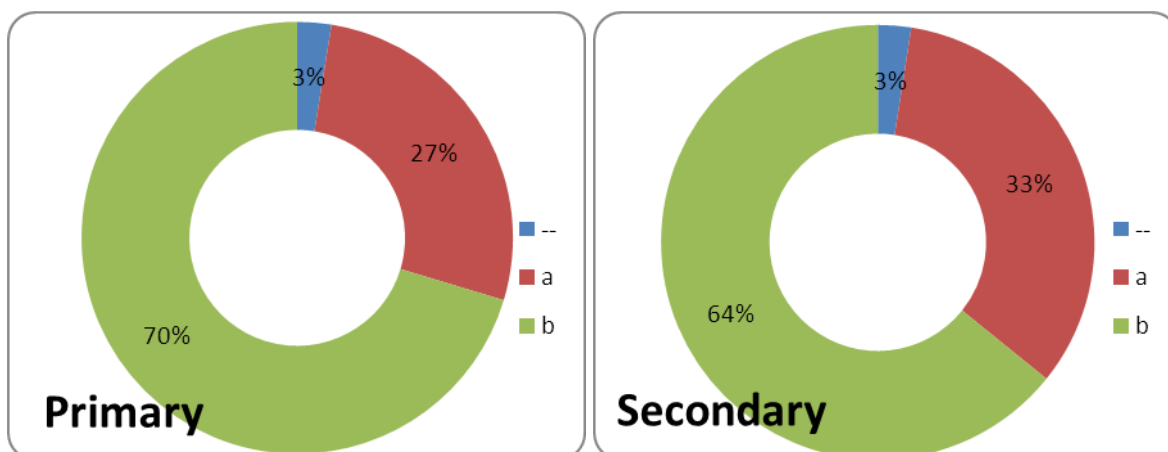


Figure 19. Do you know what is the energy class of electrical devices and how to check it

*These results indicate that the respondents are not familiar with energy classes. This indicates that it is necessary to educate respondents about the energy classes and the importance of the use of energy efficient appliances.*

**19. Are there any energy saving measures in your school and household?**

- a. Shutting down the lights and appliances when there no one in the room
- b. Using more efficient devices
- c. Monitoring the daily electrical energy tariffs
- d. Thermal insulation of household
- e. Replacement carpentry
- f. No

Table 21. Do you apply energy saving measures

		Do you apply energy saving measures						Total:	
		--	a	b	c	d	e		f
school	primary	7	158	16	19	19	8	25	236
	secondary	4	41	8	4	10	3	11	81
Total:		11	192	21	17	17	7	36	317



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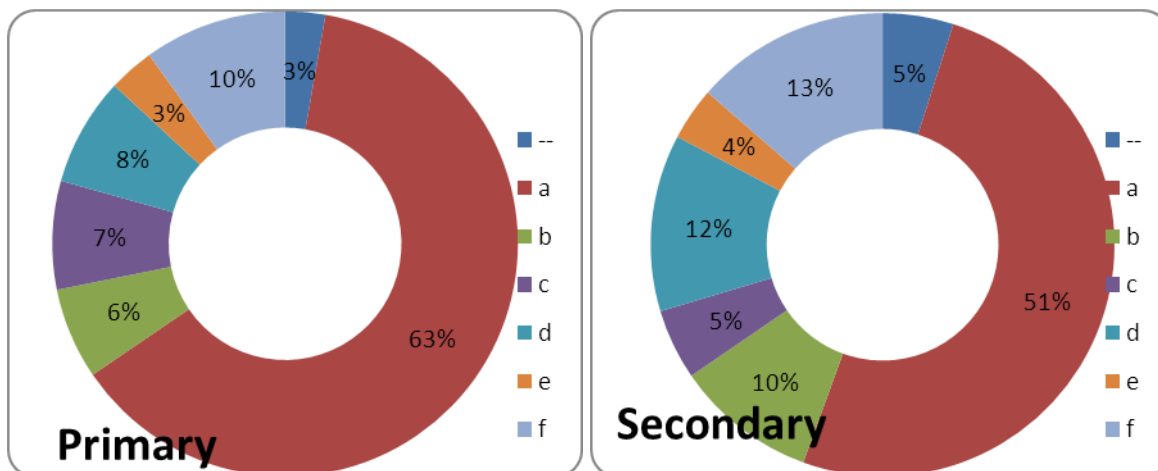


Figure 20. Do you apply energy saving measures

Using measures that do not cost participants is on high level.

**20. What forms of renewable energy are you familiar with (it is possible to give more than one answer)?**

- a. Solar
- b. Wind
- c. Biomass
- d. Hydropower
- e. Geothermal sources

Table 22. What forms of renewable energy are you know

	Renewable sources						Total:
	--	a	b	c	d	e	
school primary	8	188	118	67	60	65	236
secondary	2	71	38	13	17	20	81
Total:	10	259	156	80	77	85	317

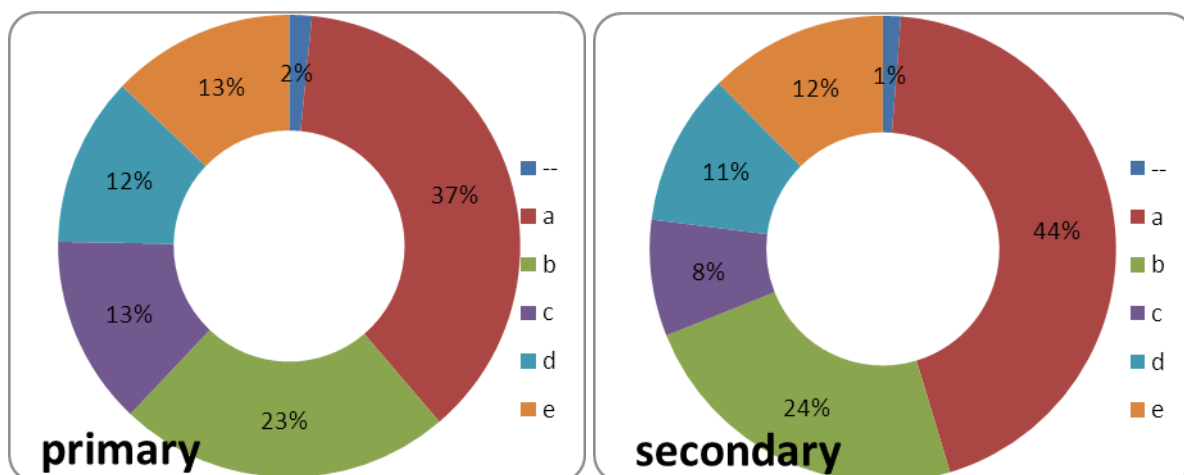


Figure 21. What forms of renewable energy are you know





**21. What is your contribution to energy efficiency and environmental protection:**

- a. Significant
- b. Partial
- c. Inadequate
- d. I cannot judge

Table 23. Evaluate your contribution to energy efficiency

	Evaluate your contribution to EE and EP					Total:
	--	a	b	c	d	
school primary	9	77	82	27	41	236
secondary	2	15	43	6	15	81
Total:	11	92	125	33	56	317

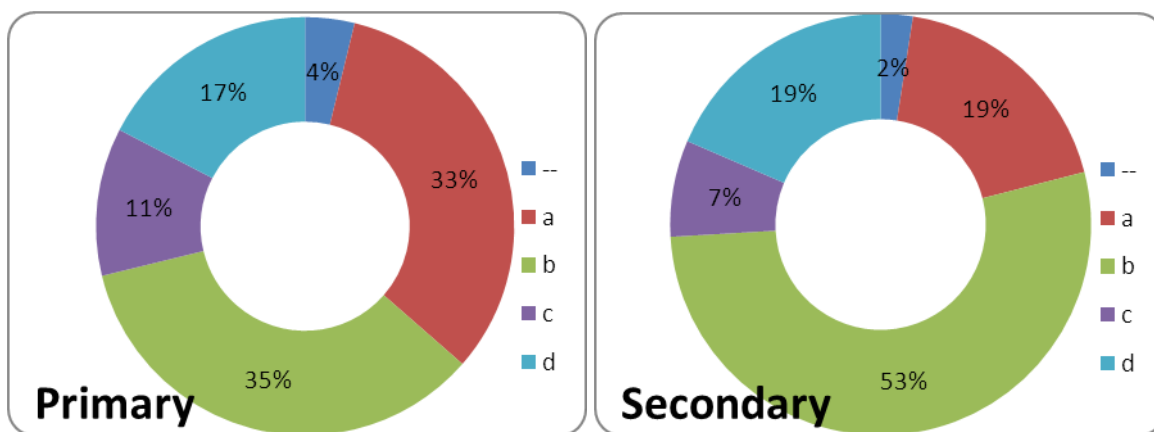


Figure 22. Evaluate your contribution to energy efficiency and environmental protection

**22. I am satisfied with the conditions of heating and ventilation system in my school:**

- a. Yes
- b. No

Table 24. Subjective assessment of heating and ventilation systems in school

	Heating and ventilation in school			Total:
	--	a	b	
school primary	10	129	97	236
secondary	2	33	46	81
Total:	12	160	142	317



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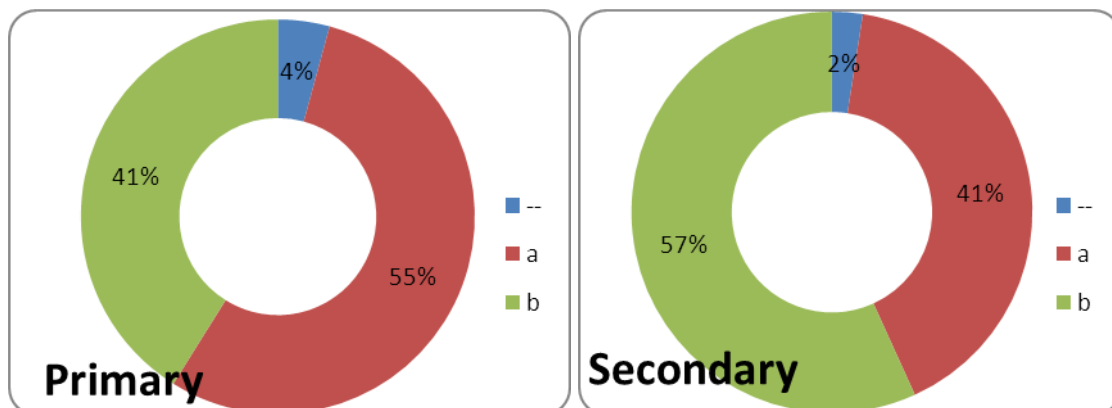


Figure 23. Heating and ventilation system in school

**23. In your opinion, which of the following factors most influences the energy efficiency?**

- a. Habits
- b. Laws and standards
- c. technologies and technical solutions
- d. Design of work processes
- e. Financial Incentives

Table 25. Which factors have the greatest impact on energy efficiency

	Factors that affect energy efficiency						Total:
	--	a	b	c	d	e	
school primary	8	141	31	30	3	28	236
secondary	2	52	10	17	2	9	81
Total:	10	193	41	47	5	37	317

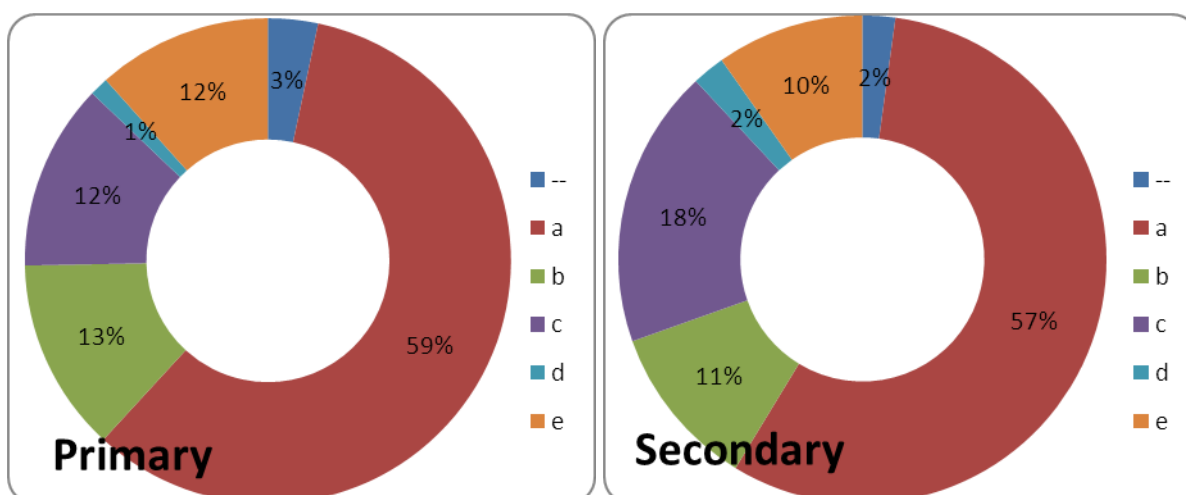


Figure 24. The factors that most influence the energy efficiency

It is necessary to educate respondents about the importance of measures of use of energy efficient devices.

**24. Would you take part in the competition of energy saving if the saved money than invest in equipment to upgrade the teaching and the variety of courses on new technologies whose holder will be a school?**

- a. Yes
- b. No



Table 26. Willingness to participate in the competition in the energy savings

		Would you like to compete			Total:
		--	a	b	
school	primary	8	155	73	236
	secondary	4	33	44	81
Total:		12	187	117	317

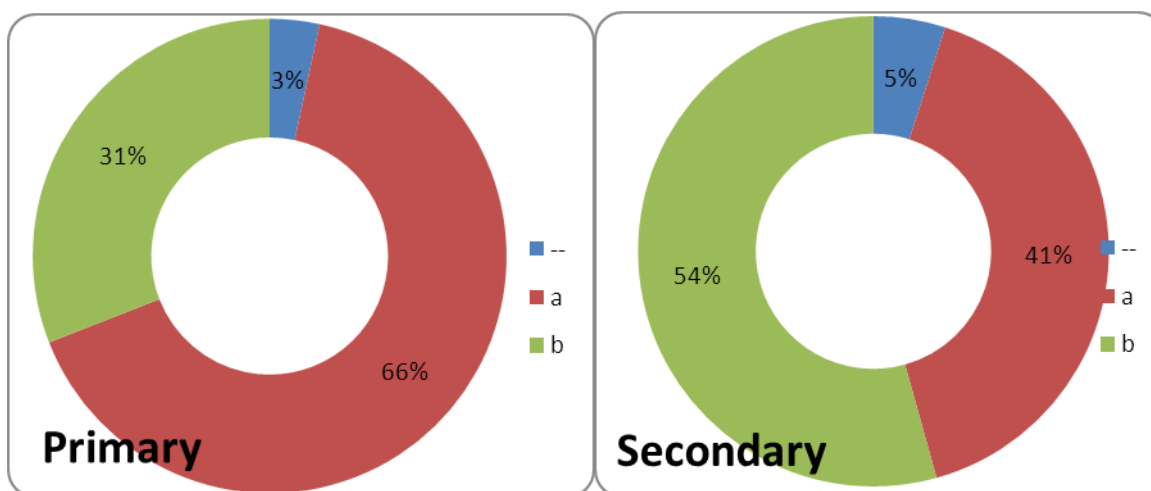


Figure 25. Participation in the competition in energy savings and investing in the improvement of conditions at school

At the end of the survey it is allowed to respondents to provide their comments and feedback. There were no specific comments.

For the most questions there is no difference in the structure of responses of primary and secondary school pupils. Grade of secondary school pupils are a little tougher for the topic of energy efficiency, as well as assessment of their own knowledge about the measures and devices that save energy. Also, they are a bit reserved in their assessments of personal contribution and action towards energy savings (which may be due to better understanding of the broader social processes that reduce the role of individuals but require the adoption of formal strategies and plans).

Generally, primary and secondary school pupils have a basic level of information, but the information is inaccurate, and their knowledge of energy efficiency is vague, perhaps relying on sources outside the school.

Nis, 07.08.2014

Center for energy efficiency  
Responsible person,

Ljubisa Jakovljevic, MScee