STUDY ON HUMAN DEVELOPMENT BENEFITS AND GENDER MAINSTREAMING THROUGH IMPLEMENTATION OF INFRASTRUCTURE ENERGY EFFICIENCY MEASURES IN PUBLIC BUILDINGS

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SUMMARY

Human development and gender equality are actual and important segments of economic and social development. In the segment of energy efficiency (EE), theoretical concepts and more significant analyses evaluating the impact of energy efficiency measures (EEM) to human development and gender equality are missing at micro levels of public institutions and key stakeholders. The purpose of the study is to explain the effects of implemented EEMs to human development and gender equality of employees and service users in public buildings.

To collect the data, the questionnaires for institutions, employees and service users were used. 82 public institutions participated in the assessment (FBiH-60 and RS-22), with 439 employees and 1.496 service users.

The results of EEM impact to human development indicate the facts that EEM have a positive impact to human development measured through direct and indirect effects, but there are also some problems in transparency of EEM implementation in public buildings.

The resulting positive direct effect of implemented EEMs pertains to the property value of public institutions presented through construction, mechanical and electricity works. The average value of investment per institutions totals 317.809 KM. Regarding the financial effects of EEM, significant savings were determined in heating, electricity, current maintenance and building reconstruction costs. Compared to total investments into EEM and savings in costs, the investment return period is about 20 years. EEM led to significant temperature increase in buildings during the heating season and significant temperature decrease in cooling season. The average grade of heating quality increased significantly from the insufficient to almost very good. The results indicate that the number of absences by employees slightly decreased and that EEM did not have significant consequences in terms of employment losses.

Implemented EEMs had a significant positive indirect impact to different features of employees and service users of public buildings. It was demonstrated that different specific EEM in public buildings have a positive impact to human development for key stakeholders, public institutions: employees and service users. In all aspects of human development, more significant intensity of perception of this impact to employees compared to the service users has been determined. At the same time, at service users, compared to employees, relative share of indifferent answers (grade 3) was determined for almost all features. Positive impact pertains to health, attitudes and behaviour as well as living standard of employees and service users. Importance of different EEMs was evaluated by employees and users with high level of correlation. However, the respondents significantly underestimated the expected return period of investments into EEMs compared to the findings from the study. The effects of impact of EE knowledge to behaviour of respondents clearly indicate the need for development of knowledge in this segment. Employees identify better positive effects of measures to different dimensions of living standard, such as: decrease of energy costs, positive impact to economic growth and development, potential for increase of income of population and increase of living standard. Concerns regarding increased losses of jobs and bigger difficulties at work have not been noticed among employees or users, and regarding the impact to environment protection, positive grades are dominant. Positive impact to social cohesion of employees is present

in terms of improved cooperation, motivation for participation in decision making and improved social relations. There is a positive level of satisfaction of respondents with certain physical features of premises after implementation of EEM in heating, cooling and inter seasons.

Generally, for all buildings in all seasons, the results indicate the improvement in quality of services after implementation of EEM. It was indicated that performance of low income employees compared to those with higher income is less compliant with energy efficiency. It has also been determined that low income employees perceive bigger difficulties due to implementation of EEM.

The assessment results indicate that the projects of EEM introduction were not implemented in some segments pursuant to the principles of full transparency, in terms of the access to the programme, as well as during the programme implementation. Similar implications apply to responsibility mechanisms, as well as involvement of employees and service users in implementation of EEM.

Impact of EEMs to gender equality of employees and users is analysed in the context of opportunities for achievement of equal rights and obligations, equal presence and gender benefits from implemented EEM. EE projects mainly positively affect gender equality of both, employees and service users. However, there is a significant difference between male and female service users in terms of perception of approach to EE training and professional participation in decision-making on EE, and for employees and service users in perception of the features of women empowerment, in fact prevention of gender discrimination. This pertains to perception of the role of woman in savings on energy costs, advocacy for energy use from renewable sources, environmental impact and understanding the relation between the energy consumption and climate changes. It is determined that per all gender equality features and role of women in energy consumption and EEM, perception of women was more emphasised than of men.

The study shows positive impact of EEM to gender equality in achievement of benefits from specific measure for both, employees and service users. Perception of benefits from measures to physical and mental health is somewhat higher at women than at men. Similar results are found in evaluation of employees' performance by users, while regarding the impact to social cohesion the employees indicated that men evaluated better certain aspects, while women evaluated better some other aspect. Finally, female respondents demonstrated higher level of satisfaction with physical features of premises after implementation of EEM compared to: average temperature, ventilation, lights, quality and humidity of air, sound insulation and energy consumption.

The key implications of study results are identified and recommendations are given.

CONTENTS

INTRODUCTION AND METHODOLOGY 6
1. HUMAN DEVELOPMENT AFFECTED BY ENERGY EFFICIENCY MEASURES 10
1.1. Direct effects 10
1.1.1. Property value of the project of energy efficiency measures' implementation in public buildings 10
1.1.2. Quality of heating 15
1.1.3. Effects of energy efficiency measures to recruitment of employees 16
1.2. Indirect effects of energy efficiency measures 16
1.2.1. Impact of energy efficiency measures to human health 16
1.2.2. Impact of energy efficiency measures to attitudes and behaviour of people 17
1.2.3. Impact of energy efficiency measures to living standard of people 20
1.2.3.1. General expectations from the impact of energy efficiency measures to living standard of people 20
1.2.3.2. Perception of employees and service users on potential difficulties in work affected by energy efficiency measures 21
1.2.3.3. Perception of impact of energy efficiency measures to environment protection 21
1.2.3.4. Perception of social cohesion of employees at workplace 22
1.2.3.5. Perception of performance of employees affected by energy efficiency measures 22
1.2.3.6. Satisfaction with physical features of premises after implementation of energy efficiency measures for employees and service users 23
1.2.3.7. Perception of poverty reduction 24
1.2.3.8. Perception of service users on behaviour of employees after implementation of energy efficiency measures 26
1.2.3.9. Perception of service quality improvement by employees and service users after implementation of EEM 27
1.3. Transparency and responsibility mechanisms 33
1.3.1. Analysis of transparency of the EEM implementation from the aspect of institution . 34
1.3.2. Analysis of responsibility mechanism from the aspect of institution 35
1.3.3. Analysis of transparency in implementation of energy efficiency measures in public buildings from the aspect of employees and service users 35

2. GENDER EQUALITY IN IMPLEMENTATION OF ENERGY EFFICIENCY MEASURES 38
2.1. Gender discrimination gap in the segment of energy efficiency measures for employees and service users 39
2.2. Gender equality in implementation of specific energy efficiency measure for employees and service users 42
2.2.1. Analysis of gender equality in approach to planning and implementation of specific energy efficiency measures 43
2.2.2. Analysis of gender equality in further activities on implementation of energy efficiency measures 44
2.3. Gender equality in achievement of equal benefits from specific energy efficiency measure for employees and service users 46
2.3.1. Analysis of gender benefits from energy efficiency measures for physical health of respondents 46
2.3.2. Analysis of gender equality benefits from energy efficiency measures for mental health of respondents 47
2.3.3. Analysis of equal gender individual benefits at work from energy efficiency measures for employees 48
2.3.4. Analysis of equal gender benefits from social cohesion at work as a consequence of energy efficiency measures 49
2.3.5. Analysis of gender individual benefits from performance of employees after implementation of energy efficiency measures for service users 50
2.3.6. Analysis of gender differences in satisfaction with physical features of premises after implementation of energy efficiency measures 51
3. IMPLICATIONS OF THE MAIN STUDY RESULTS AND RECOMMENDATIONS 56
3.1. Key recommendations related to human development 56
3.2. Key recommendations related to gender equality 58

INTRODUCTION AND METHODOLOGY

- **Introduction**

Planning, introduction and exploitation of energy efficient projects led to the changes in different segments of life and work of people and public and private institutions. Although energy efficiency is primarily a technological challenge, it directly and indirectly influences prosperity of country, competitiveness of national economies, human development, competitiveness of enterprises and socio-economic development of population. Investing into energy efficiency measures (hereinafter referred to as: EEM) has multiple benefits for population and state, pertaining to property value, welfare of population, physical and mental health of people, social cohesion, energy security, decrease of costs, economic growth, employment and similar. Therefore, measuring and understanding the efficiency of EEM and socio-economic development of people influenced by different energy efficiency mechanisms is important segment of social and economic development of national economies.

Implementation of EEM in public sector should be an example and should encourage public and private sector to accept the energy efficiency standard and implementation of different measures, and to establish in a long run the positive attitude of people towards the energy efficiency projects. In previous period, UNDP coordinated the programme of implementation of different EEM in public buildings within BiH. Measuring progress in quality of life, human development, gender equality and poverty reduction may be achieved by determining the effects and values of the achieved EEM for direct users (institutions, employees and service users). Therefore, evaluation of effectiveness and efficiency of implemented EEM in public buildings within BiH may be considered from the aspect of institution, employee and service users in the context of human development and gender equality. Therefore, the subject of this study pertains to human development and gender equality influenced by implemented EEM. In this regard, the main question of the study is whether the implemented EEM in public buildings have an impact to human development and gender equality, and how big is that impact?

Particular assessment questions are:

- What is direct and indirect impact of EEM implementation in public buildings to human development?
- Was the EEM programme planned and implemented from the perspective of respect for human rights and transparency?
- Do the EEMs have a negative impact to gender equality and has the gender equality issue improved in planning and implementation of EEM and continued activities in the segment of energy efficiency?

- **Theoretical basis of the study**

Human development and gender equality are actual and important segments of economic and social development. Particular interest pertains to evaluation of progress and achievements of the countries in those segments, so that different indexes to measure those achievements were developed. In the segment of energy efficiency, theoretical concepts and more significant analyses evaluating the impact of EEM to human development and gender equality are missing at micro levels of institutions and key stakeholders.

The effects of EEM to human development pertain to the set of socio-economic dimensions of progress achieved or expected to be achieved by people, influenced by implemented energy efficiency projects. In public premises, the most important impact of those measures is to human development of employees and public service users. The values of human development for employees and public service users, as a result of specific EEM, in addition to direct technical and financial effects, include indirect effects pertaining to the progress of their health, property value, welfare, poverty reduction, social cohesion, improved quality of life and living standard, gaining knowledge on this segment, long-term establishment of positive attitude towards energy efficiency projects, etc.

Key dimensions of human development, as a result of implemented EEM in public premises, are related to Human Development Index – HDI. They include direct and indirect effects of EEM. Direct effect pertains to different technical improvements, financial savings, improved quality of heating, decrease of absences by employees, etc. Key indirect effects include the impact of EEM to health, attitudes and behaviours, as well as living standard of people. Transparency of the process can be added to this as it is the public sector. Each of those dimensions should be observed from the perspective of human rights, development of human capabilities (health, knowledge, values, etc.) and use of those capabilities to increase the level of life quality (increase of living standard, poverty reduction, etc.).

The content of gender equality affected by EEM in public buildings is related to the Gender Inequality Index - GII. Key aspects of gender equality in all segments, including EEM, pertain to: equal gender rights and duties, equal gender opportunities in achievement of rights, equal gender presence in the segment of EEM and equal gender benefits from implemented EEM. Based on those gender equality segments, the key gender equality dimensions affected by EEM are identified and defined, including: gender discrimination gap in the segment of EEM, gender equality in implementation of specific EEM, in continued activities on implementation of EEM and in achievement of equal gender benefits from specific EEM for employees and service users.

- **Study objectives**

The main goal of this study is to develop and evaluate the model for measuring EEM impact to human development and gender equality. The purpose of the study is to explain the effects of implemented EEM to human development and gender equality of employees and service users in public building where the EEMs are implemented. To achieve the main goal and purpose, it is necessary to develop theoretical framework and to evaluate human development and gender equality affected by implemented EEM from the aspect of public institutions where EEM was implemented, employees and service users.

- **Variables and indicators**

Impact of EEM to human development and gender equality included two key segments:

- Impact of EEM to human development, and
- Impact of EEM to gender equality.

Within human development, three segments were identified: direct and indirect impact of EEM, as well as transparency of implementation process. Direct effects of implemented EEM pertain to

technical effects of the programme of EEM implementation to public buildings, financial aspects, quality of heating and recruitment of labour. Indirect effects of implemented EEM include the impact of EEM to health, attitudes and behaviour, as well as living standard of people. Transparency of EEM implementation is considered from the aspect of institution, employees, users and responsibility mechanisms.

Impact of EEM to gender equality includes three segments: gender discrimination gap in the segment of EEM, gender equality in implementation of specific EEM and gender equality in achievement of equal benefits from specific EEM.

Each of identified components of human development and gender equality include several dimensions with identified indicators (as presented in the Appendix 0).

- **Research procedure and data**

Research procedure had the features of E-POST experiment, which means that the research was conducted after implementation of EEM in public buildings. Data were collected through interviews with public institutions, employees and service users in period from 01.10 to 31.11.2017. The content of the questionnaires for institution on programme features and effects of EEM implementation in public building, for employees and users of public buildings complied with the previously identified indicators, and the questionnaire forms are presented in the Appendix 3. The questionnaire for institution included the questions pertaining mainly to the factual findings related to EEM. The questionnaire for employees and service users was based on perceptive situations affected by specific EEM. The used measuring scales were five-grade Likert scales (1 – absolute disagreement with statement to 5 – absolute agreement with statement). Parts of the questionnaire pertaining to services provided by the institution are adjusted to the specific features of the institutions themselves and services they provide.

- **Sample and participants in the research**

Participants in the study were the management of public institutions, employees and service users in public buildings of BiH where EEMs were implemented. Of 85 public institutions, 82 participated in the study.

The employee sample comprised only those employees who worked in the building before and after implemented EEM, and the service users sample included only those users who used public buildings before and after implemented EEM.

Compared to population, quota sampling was used as employees against the control features of employees: gender and post. Control feature at quota sampling of service users was the gender of respondent. Of total number 5.060 employees in the covered public institutions, the sample included 439 employees or 8,68% of the population. Of total number 36.339 service users, the sample included 1.496 or 4,12% of the population. Of that number, share of male respondents at employees was 40,83%, and female respondents 59,17%. The service users samples comprised 47,05% male respondents and 52,95% female respondents. The structure of employees sample and service users sample against the population and type of public building, as well as compared to key socio-demographic features of employees and service users (gender, education degree, age, number of household members and average monthly household income) are presented in the Appendix 0.

- **Methods used in data analysis**

The following data analysis methods were used:

- Cronbach alpha to determine internal consistency of measuring scales as whole for employees and service users and subscales for certain dimensions,
- Comparative analysis,
- Absolute and relative frequencies of features,
- Mean values and standard deviations,
- Rank-sum method, Spearman correlation coefficient and Kendall's coefficient of concordance and
- T-test and ANOVA.

- **Internal consistency of developed measuring instruments**

To test internal consistency of developed measuring scales as whole and subscales for employees and service user, Cronbach alpha was used. The value of Cronbach alpha for measuring scale as whole for employees totals 0,965, while for service users 0,940. The obtained Cronbach alpha values, since higher than critical value of 0,7 confirm high reliability of measuring scales as whole for the selected target groups.

The values of Cronbach alpha for individual subscales pertaining to dimensions of human development and gender equality of employees are significantly above the critical value of 0,7, except for the subscale for dimension „Impact of EEM to general population health“ which is very close to this critical value. At the same time, the calculated Cronbach alpha values for individual subscales pertaining to the dimensions of human development and gender equality of service users indicate that only two subscales have the Cronbach alpha value somewhat below the critical value, and those are the subscales for dimension: „Impact of EEM to general population health“ and “Impact of EEM to environment protection“, whose values are very close to critical value. Therefore, it may be concluded that each individual subscale pertaining to different dimensions of human development and gender equality meets the conditions of internal consistency. The table with Cronbach alpha values is given in the Appendix 0.

- **Organisation of reports**

This study describes the results of the studies implemented in public building, among employees and service users of public buildings where EEMs were implemented. In addition to introduction and methodology presented in the beginning, the study comprises three chapters and Appendices. The first chapter pertains to the analysis of EEM impact to human development, while the second chapter includes the analysis of gender equality during implementation of EEM. The third chapter describes implications of the study and recommendations. The Appendices include different tables pertaining to introduction (Appendix 0), tables with relative frequencies and median values presented graphically or described only, as well as results of ANOVA and T-test in the first (Appendix 1) and the second chapter (Appendix 2), as well as three questionnaires (Appendix 3).

1. HUMAN DEVELOPMENT AFFECTED BY ENERGY EFFICIENCY MEASURES

Results of EEM impact to human development are presented in this part of the report. Those findings indicate the fact that EEM have a positive impact to human development measured through direct and indirect effects related to the dimensions of human development index (HDI). However, when it comes to transparency in EEM implementation process the key problems have been identified whose resolving could improve the transparency of the internal preparation process, nominating and selecting the public institution and specific EEM.

1.1. Direct effects

Direct effects of implemented EEM pertain to the property value of EEM implementation in public buildings, financial aspects, quality of heating and recruitment of labour. The results of analyses show that significant improvements have been made in technical features and value of public buildings where EEM were implemented, that significant cost savings have been generated, that quality of heating has improved and that absences of employees from work have slightly decreased.

1.1.1. Property value of the project of energy efficiency measures' implementation in public buildings

EEM projects coordinated by UNDP were implemented in 85 buildings, thus significantly increasing their property value. Three institutions did not participate in the study: Novo Sarajevo municipality, Posušje municipality and kindergarten "Sunčani most" Livno, so that the study included 82 institutions or 96,47% of total group. The structure of the included institutions mainly pertains to schools (59,76%), followed by kindergartens (13,41%), public administration (6,10%), while other activities participate with less than 5%. This structure indicates that there is a dominant share of institutions providing services to users during the day (91,46%), while 7 institutions were all-day care & nursing institutions (hospitals and centres for accommodation of vulnerable categories).

Of total number of the assessed institutions, 60 were from the Federation BiH (73,17%) and 22 from the Republika Srpska (26,83%). The same structure was maintained in geographic distribution with 60 buildings from the north and 22 buildings from the south part of BiH. Bigger share of institutions from the northern part, where exposure to cold during the winter period is bigger, provides better insight into effects of implemented measures in the segment pertaining to heating. The table 1.1 shows the structure of building per activities, entities and regions.

No	Type of public institution	Entity				Region				Total	
		FBiH		RS		North		South			
		f	%	f	%	f	%	f	%	f	%
1	Hospitals	2	3,33	2	9,09	4	6,67	0	0,00	4	4,88
2	Health centres	3	5,00	1	4,55	4	6,67	0	0,00	4	4,88
3	Culture institution	1	1,67	0	0,00	1	1,67	0	0,00	1	1,22
4	Sport institution	1	1,67	0	0,00	1	1,67	0	0,00	1	1,22

5	Public administration	3	5,00	2	9,09	4	6,67	1	4,55	5	6,10
6	School for children with special needs	1	1,67	0	0,00		0,00	1	4,55	1	1,22
7	Schools	36	60,00	13	59,09	36	60,00	13	59,09	49	59,76
8	Faculty	1	1,67	2	9,09	2	3,33	1	4,55	3	3,66
9	All-day care & nursing centres	3	5,00	0	0,00	1	1,67	2	9,09	3	3,66
10	Kindergartens	9	15,00	2	9,09	7	11,67	4	18,18	11	13,41
Total		60	100,00	22	100,00	60	100,00	22	100,00	82	100,00

Table 1.1. Distribution of public buildings where EEMs are implemented, per activity, entity and region

EE measures were implemented in individual public buildings using individual or combination of the following types of works:

- Construction works – including civil engineering works related to installation, replacement or repair of inside and outside joinery, roof, tin sheet, thermal facade and thermal insulation of certain parts of whole building, hydro insulation, as well as construction works related to installation / replacement of heating boiler.
- Mechanical works – including making, replacement or repair of boiler room / heating boiler, water container, radiator, closed expansion dishes and expansion systems, thermal valves, high-efficient pumps, regulation according to outside temperature, thermal insulation of pipeline, installation of sound water flow meter and solar collectors to the roof.
- Electrical works – including related electrical installation works.

The construction works have the biggest share in the structure of types of work pertaining to EEM presented in the table 1.2, either alone or in combination with other types of works, followed by mechanical works, either alone or in combination with other types of work.

Type of works	Number of buildings	%
Construction	37	45,12%
Mechanical	6	7,32%
Construction and mechanical	33	40,24%
Construction, mechanical and electrical	6	7,32%
Total	82	100,00%

Table 1.2. Types of conducted works within implemented EEM

Distribution of conduced works according to the activities of the building is presented in the Table 1.3.

No	Type of public institution	Construction		Mechanical		Construction and mechanical		Construction, mechanical and electrical	
		f	%	f	%	f	%	f	%
1	Hospitals	2	5,41	1	16,67	0	0,00	1	16,67
2	Health centres	1	2,70	0	0,00	3	9,09	0	0,00
3	Culture institution	0	0,00	0	0,00	1	3,03	0	0,00
4	Sport institution	0	0,00	1	16,67	0	0,00	0	0,00
5	Public administration	1	2,70	0	0,00	4	12,12	0	0,00

6	School for children with special needs	0	0,00	0	0,00	1	3,03	0	0,00
7	Schools	24	64,86	0	0,00	21	63,64	4	66,67
8	Faculty	1	2,70	1	16,67	0	0,00	1	16,67
9	All-day care & nursing centres	1	2,70	1	16,67	1	3,03	0	0,00
10	Kindergartens	7	18,92	2	33,33	2	6,06	0	0,00
Total		37	100,00	6	100,00	33	100,00	6	100,00

Table 1.3. Types of conducted works per type of institution

For 64 institutions that submitted the information on total value of the investments into energy efficiency increase, total value of the investment is 20.339.774 KM. The average value of the investment per institution is 317.809 KM (standard deviation is 299.714 KM). Values of investments range between 21.800 KM and 1.600.000 KM. The table 1.4 shows the values of investments per types of institutions, where it can be noticed that the average investments are the biggest in faculties and health institutions (hospitals and health centres).

No	Type of public institution	Value of investment (KM)	%	No.of buildings	Average investment per building (KM)
1	Hospitals	1.400.000	6,88	2	700.000
2	Health centres	1.674.503	8,23	3	558.168
3	Culture institution	338.396	1,66	1	338.396
4	Sport institution	-	-	-	-
5	Public administration	779.168	3,83	4	194.792
6	School for children with special needs	500.000	2,46	1	500.000
7	Schools	11.816.184	58,09	39	302.979
8	Faculty	1.656.000	8,14	2	828.000
9	All-day care & nursing centres	752.851	3,70	3	250.950
10	Kindergartens	1.422.673	6,99	9	158.075
Total		20.339.774	100,00	64	317.809

Table 1.4. Values of investment per type of institution

Financial effects of implemented energy efficiency measures

For more precise calculation of the effects of implemented EEM, the tables 1.5-1.12 show, per type of institution, the data on investments (Table 1.5) and change of average annual costs per cost categories. The analysis includes only those 49 institutions that submitted the data including the value of investment and average annual costs of heating and electricity prior and after implementation of EEM.

No	Type of public institution	No.of buildings	Value of investment (KM)	(%)
1	Hospitals	2	1.400.000	9,45%
2	Health centres	2	1.343.503	9,07%
3	Culture institution	1	338.396	2,28%
4	Sport institution	-	-	-
5	Public administration	4	779.168	5,26%

6	School for children with special needs	1	500.000	3,37%
7	Schools	27	7.971.794	53,80%
8	Faculty	1	650.000	4,39%
9	All-day care & nursing centres	2	412.852	2,79%
10	Kindergartens	9	1.422.673	9,60%
Total		49	14.818.385	100,00%

Table 1.5. Value of investments per types of institutions for the selected institutions

Looking at the trend of average annual costs of heating before and after implementation of EEM per type of institution, it may be noticed that the biggest effects have been achieved in hospitals, health centres and schools. Savings in annual costs of heating total 32,76%. The data on trend of those costs per types of institutions are presented in the Table 1.6

No	**Type of public institution**	**No.of buildings**	**Average annual heating costs (KM)**		**Difference (KM)**
			Before	After	
1	Hospitals	2	680.000	427.000	253.000
2	Health centres	2	217.300	69.777	147.523
3	Culture institution	1	21.380	14.245	7.135
4	Sport institution	-	-	-	-
5	Public administration	4	71.840	35.800	36.040
6	School for children with special needs	1	5.800	7.100	-1.300
7	Schools	27	823.776	691.378	132.398
8	Faculty	1	62.000	23.000	39.000
9	All-day care & nursing centres	2	75.557	63.444	12.113
10	Kindergartens	9	159.322	91.618	67.703
	Total	49	2.116.974	1.423.362	693.612

Table 1.6. Change of average annual costs of heating before and after EEM implementation

The table 1.7 shows that biggest decrease in average annual electricity costs have been achieved in hospital, schools and kindergartens. Annual savings in electricity costs total 11,71%.

No	**Type of public institution**	**No.of buildings**	**Average annual electricity costs (KM)**		**Difference (KM)**
			Before	After	
1	Hospitals	2	421.600	377.820	43.780
2	Health centres	2	71.110	66.496	4.614
3	Culture institution	1	13.905	14.606	-701
4	Sport institution	-	-	-	-
5	Public administration	4	60.341	53.402	6.939
6	School for children with special needs	1	5.200	5.200	0
7	Schools	27	179.931	160.772	19.160
8	Faculty	1	35.000	27.000	8.000
9	All-day care & nursing centres	2	71.234	61.898	9.336
10	Kindergartens	9	66.169	49.015	17.154
Total		49	924.490	816.209	108.281

Table 1.7. Change of average annual costs of electricity before and after EEM implementation

The table 1.8 shows that significant decrease in current maintenance costs has been achieved in schools and kindergartens, while in the assessed health centre the costs significantly increased. Annual savings in current maintenance costs total 6,51%.

No	Type of public institution	No.of buildings	Average annual current maintenance costs (KM)		Difference (KM)
			Before	After	
1	Hospitals	1	10.000	8.000,00	2.000,00
2	Health centres	1	8.702	31.640,00	-22.938
3	Culture institution	1	5.000	5.000	0
4	Sport institution	-	-	-	-
5	Public administration	4	14.715	16.800	-2.085
6	School for children with special needs	1	600	600	0
7	Schools	24	120.502	99.441	21.062
8	Faculty	1	15.000	9.000	6.000
9	All-day care & nursing centres	1	3.215	2.819	396
10	Kindergartens	9	44.162	34.159	10.003
Total		43	221.896	207.458	14.438

Table 1.8. Change of average annual costs of current maintenance before and after EEM implementation
Note: The data pertain to 43 of 49 included buildings.

The average annual costs of building repair significantly decreased in schools and assessed faculty, while the costs increased in health centres (Table 1.9). Annual savings in building repair costs total 38,21%.

No	Type of public institution	No.of buildings	Average annual costs of repair in and on building (KM)		Difference (KM)
			Before	After	
1	Hospitals	1	10.000	8.000	2.000
2	Health centres	2	17.430	21.245	-3.815
3	Culture institution	1	8.000	1.500	6.500
4	Sport institution	-	-	0	-
5	Public administration	4	4.520	500	4.020
6	School for children with special needs	1	600	0	600
7	Schools	25	95.716	65.295	30.422
8	Faculty	1	25.000	5.000	20.000
9	All-day care & nursing centres	1	11.105	8.490	2.615
10	Kindergartens	6	12.000	3.900	8.100
Total		42	184.371	113.930	70.442

Table 1.9. Change of average annual costs of repair on and in building before and after EEM implementation
Note: The data pertain to 43 of 49 included buildings.

Results for the selected buildings in terms of costs saving are summarised in the Table 1.10, where the average annual savings in current maintenance costs and building repair costs, considering the smaller amount of available data, are estimated at the level of 49 buildings (correction coefficient 49/43 and 49/42 respectively).

Type of costs	Total savings (KM)	Share (%)
Heating costs	693.612	77,02
Electricity costs	108.281	12,02
Costs of current maintenance of building	16.453	1,83
Building repair costs	82.182	9,13
Total	900.528	100

Table 1.10. Effect of average annual costs decrease for the selected institutions

As the value of total investments in selected 49 buildings is 14.818.385 KM and total decrease of average annual costs is 900.528 KM, using the interest rate of 2% and annual capitalization, decursively, it will take 20,15 years to return the value of total investment. Considering that in the selected 49 buildings there are 2.871 employees in total, and that total number of users is 20.701, the amount of investment of 5.161 KM per employee and 716 KM per user is obtained, while the amount of savings is 314 KM per employee and 44 KM per user.

1.1.2. Quality of heating

The table 1.11 gives the effects of EEM implementation in terms of average temperature in the building during the heating season, cooling season and inter-seasons. Obviously, EEM led to significant increase of temperature in buildings during the heating season and significant temperature decrease in cooling season. In inter-seasons, the average temperature in buildings slightly increased.

Description	Before EEM implementation		After EEM implementation		Temperature difference before - after
	Arithmetic mean	Standard deviation	Arithmetic mean	Standard deviation	
Average temperature in building during heating season (15.10.-15.04)	18,90	2,93	22,28	2,11	3,38
Average temperature in building during inter-seasons (16.04.-14.06. and 16.09.-14.10)	21,13	3,30	21,46	2,64	0,33
Average temperature in building during cooling season (15.6.-15.09.)	26,01	4,30	24,17	4,54	-1,84

Table 1.11. Average temperature in buildings before and after implementation of EEM

In addition to previously mentioned, the effects of implemented EEM may be estimated based on the attitudes of institutions' management on the quality of heating before and after implementation. Those attitudes are summarized in the table 1.12 showing that the average grade of heating increased for 1,70, in fact from the level of insufficient to almost very good.

Grade	Before		After		Difference	
	f	%	f	%	f	%
1	21	27,27%	0	0,00%	-21	-27,27%
2	34	44,16%	3	4,55%	-31	-40,26%
3	18	23,38%	22	33,33%	4	5,19%
4	2	2,60%	27	40,91%	25	32,47%

5	2	2,60%	14	21,21%	12	15,58%
Total	77	100,00%	66	100,00%	-11	-14,29%
Average grade	2,09		3,79		1,70	
Standard deviation	0,92		0,83		-0,09	

Table 1.12. Evaluation of heating quality before and after implementation of EEM

1.1.3. Effects of energy efficiency measures to recruitment of employees

The table 1.13 shows the effects of implemented EEM in the context of their impact to average annual number of absences of employees from work and number of employees re-allocated to other posts due to implementation of EEM, in fact employees who lost the employments. The results indicate that the absences of employees from work slightly decreased, for 1,43% and that EEM did not have major consequences in terms of employment losses. Of 4.814 employees, only two employees lost the employments due to implemented EEM, while 11 employees were re-allocated to other posts.

Description	Total
Average annual number of absence days of employees from work (before EEM implementation)	6.343
Average annual number of absence days of employees from work (after EEM implementation)	6.252
Difference (before – after)	91
Number of employees re-allocated to other posts due to implementation of EEM	11
Number of employees who lost employment due to implementation of EEM	2

Table 1.13. Effect of EEM implementation to employees

1.2. Indirect effects of energy efficiency measures

This chapter addresses the indirect effects of EEM. It was demonstrated that different specific EEM in public buildings have a positive impact to dimensions of human development for key stakeholders of public institutions: employees and service users. Positive impact pertains to human health, attitudes and behaviour, as well as living standard of employees and service users. In all aspects of human development, significant intensity of perception of this impact to employees has been determined, than at service users. The employees had much more experience with some of EEMs than the users, so therefore the perception of users was of a lower intensity. At the same time, service users compared to employees showed higher relative share of indifferent answers (grade 3) in all features. This may be explained by the fact that they were less informed about EEM, as well as by their insecurity and lower interest.

1.2.1. Impact of energy efficiency measures to human health

EEM has a significant positive impact to different dimensions of human health, such as general human health, physical and mental health of employees and service users, but with different intensity.

Results of the analysis of perception of EEM impact to general human health confirm that employees and service users have mainly positive attitude towards this impact. The respondents perceive more significantly the positive impact of EEM to human health on a long-term run than to human age. At employees the average grade of positive impact of EEM to human health on a long-term run is 4,19, while at the users it totals 3,92. Comparing the average grades of positive EEM impact to human age, for employees totals 3,97, while for service users it totals 3,57.

Specific EEM have a positive impact to physical and mental health of employees. In the context of physical health, the most important consequences of EEM impact expressed in average values pertain to different aspects of performance of business activities in the building, such as: more active work (4,08), encourage putting more energy into performance of activities (4,03), increase of work capacities (3,94), more productive work (3,94) and lower tiredness (3,86). However, the poorest average grade of all features of EEM impact to physical health of employees pertains to the impact of EEM to stabilization of health condition (3,69). For employees, the most significant feature of impact of the specific EEM to mental health pertains to the comfort in building with average value of 4,29 which is the highest average grade of all features of human health. For employees, other features of mental health have the following average values: better concentration – 3,81, higher self-confidence – 3,75 and better memorizing – 3,56.

Similar results apply to the perception of positive impact of specific EEM to physical and mental health of service users, but with poorer intensity and average grades which are for most of the features close to indifferent attitude (3). Of the features of EEM impact to physical health, service users perceive most significantly the encouragement of investing more energy into performance of activities in the building with average grade of 3,53 followed by the following features: impact of EEM to stabilization of health condition (3,49), more active (3,47) and productive work (3,45), increased work capacities 3,36 and lower tiredness (3,29). For service users as well the most significant feature of impact of specific EEM to mental health pertains to the comfort in building with average value of 4,03, which is the highest average grade of all features of human health, followed by the features pertaining to higher respect from service provider (3,45), better concentration (3,41) and better memorizing (3,08)

1.2.2. Impact of energy efficiency measures to attitudes and behaviour of people

Dimensions of EEM impact to attitudes and behaviour of employees and service users includes three segments:

- Priorities of different EEM,
- Perception of investment return period into EEM and
- Behaviour of employees in daily life.

Employees and service users ranked per importance the impact of EEM to energy saving (from 1 – the most important measure to 7 – the least important measure). To determine mutual connection of EEM ranks for employees and service users, the Spearman correlation coefficient and Kendall's concordance coefficient were calculated. To obtain the final EEM rank for employees, service users and total (employees + users) the method of ranks summing is used. Those data are presented in the Table 1.14.

Energy efficiency measure	Employees		Users		Total	
	Rank sum	Rank sequence	Rank sum	Rank sequence	Rank sum	Rank
Warming up of the building	781	1	2.934	1	3.715	1
Better quality joinery	1.046	2	4.066	2	5.112	2
Use of energy efficient appliances	1.676	3	6.080	4	7.756	4
Solar collector and photovoltaic cells	2.097	5	7.542	6	9.639	5
Use of energy saving light bulbs	2.242	6	7.429	5	9.671	6
Thermostats with programmable work regime	2.272	7	7.838	7	10.110	7
Hydro insulation measures	1.708	4	5.077	3	6.785	3

Table 1.14. Ranking EEM per importance of their impact to energy saving

Spearman correlation coefficient and Kendall's concordance coefficient confirm high connection between the rank sequence of EEM, for employees and service users. Spearman correlation coefficient of rank between EEM sequence rank per importance of their impact to energy saving, for employees and service users, totals 0,93 (max 1), which means very high level of correlation between the responses of employees and service users to this question. Kendall's concordance coefficient for the same rank sequences for employees and service users totals 0,96 (max 1) showing very strong connection of employees and service users ranking in the context of different EEMs.

By summarizing the EEM ranks, the rank of individual EEM per importance of its impact to energy saving for employees and service users as well as for all respondents in total has been determined. After summarizing the EEM ranks in terms of energy saving, for both, employees and service users (total), the following rank sequence of EEM has been obtained in the context of energy saving: 1. warming up of the building, 2. better quality joinery, 3. hydro insulation measures, 4. use of energy efficient appliances, 5. solar collector and photovoltaic cells, 6. use of energy saving light bulbs and 7. programmable thermostats. The rank sequence of use of the energy saving bulbs is interesting (rank 6), which may be explained with the lack of information on actual effects of this measure.

Employees and service users evaluated the average return period of investments into EEM. Distribution of absolute and relative frequencies for employees and service users is given in the Table 1.15.

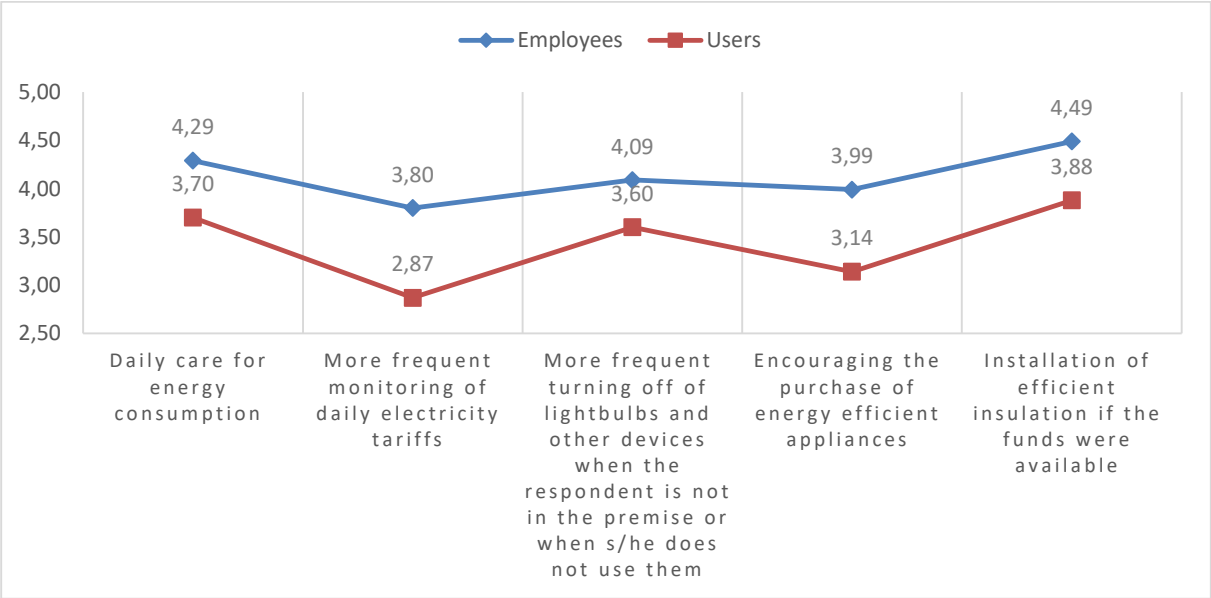
Return period (years)	Employees		Service users	
	Absolute frequency	Relative frequency (%)	Absolute frequency	Relative frequency (%)
to 3	26	5,92	184	12,36
3-4	109	24,83	551	37,00
5-6	139	31,66	412	27,67
7-8	81	18,45	178	11,95
8-9	27	6,15	63	4,23
Over 9	57	12,98	101	6,78
Total	439	100	1489	100

Table 1.15. Frequency of responses about return period of investments in EEM

Based on the analysis of absolute and relative frequencies, most of employees evaluated that the average return period of the investments in EEM is 5-6 years, followed by the period of 3-4 years. The situation with service users is opposite. Most of them believe that the average return period of investments into EEM is 3-4 years, followed by those who believe that this period is 5-6 years. Employees evaluated that the average return period of investments into EEM is 5,84 years with standard deviation of 0,33. For service users, the average return period of investments into EEM is shorter totalling 4,90 years with standard deviation of 0,19. By comparing the evaluation of employees and service users with determined results on return period of investment into EEM of about 20 years, it may be determined that positive expectations of the respondents are much different from actual situation, which may be corrected with proper dissemination of information and assessment of the investment return period for each specific measure.

Implementation of EEM in public sector affects the level of employees' and service users' knowledge about energy efficiency. Cognitive approach of learning at introduction of new products/services, such as EEM, produces new needs and wishes at people, thus affecting their behaviour. Self-evaluation of the impact of knowledge about energy efficiency to daily behaviour of people is conducted for employees and service users in the buildings where the EEMs have been implemented.

The average values of impact of energy efficiency knowledge to daily behaviour of employees and service users are presented graphically (Picture 1.1).



Picture 1.1. Average values of impact of energy efficiency knowledge to daily behaviour of respondents

Regarding the impact of energy efficiency knowledge to daily behaviour of people, in average, impact of this knowledge to daily behaviour of employees is higher than of service user. However, by ranking the average values of the assessed features for employees and service users, identical rank sequence was determined. So, the most important feature pertains to „putting efficient insulation to the buildings where the respondent lives if the funds were available“. It indicates the awareness of respondent on importance of thermal insulation in the building, as well as on financial limitations. Second by importance feature of respondents behaviour pertains to „daily care for energy

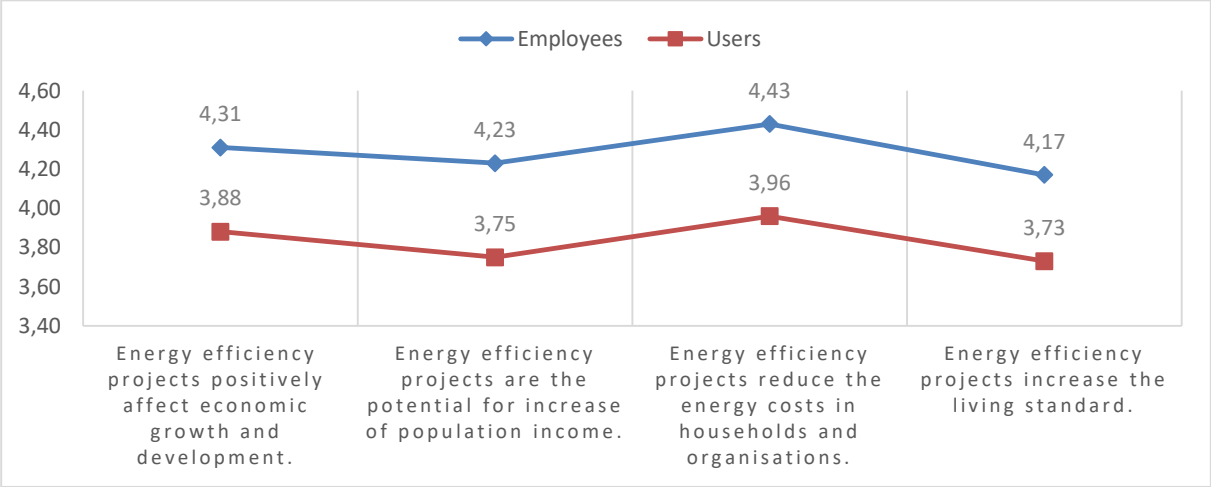
consumption“, while the third by importance feature of respondents behaviour affected by energy efficiency knowledge pertains to „more frequent turning off the lights and other devices when the respondent is not in the premises or when s/he does not use them“. The lowest average values pertain to the feature „more frequent monitoring of daily electricity tariffs“.

1.2.3. Impact of energy efficiency measures to living standard of people

Living standard is related to general welfare, in fact meeting physical, spiritual and social needs. Living standard includes work and social living and work conditions of population. Human Development Index means that living standard is achieved through capability of providing decent income for living. Looking at the impact of EEM, the living standard is related to comfort, social relations, residential standard, standard of the workplace, quality of service provision, etc. Different segments of living standard have specific meaning in the context of impact of implemented EEM to the living standard of people in public buildings.

1.2.3.1. General expectations from the impact of energy efficiency measures to living standard of people

The results indicate that there are positive general expectations of EEM impact to living standard of people for employees and service users. The average values of different features of general expectations are presented in the Picture 1.2.

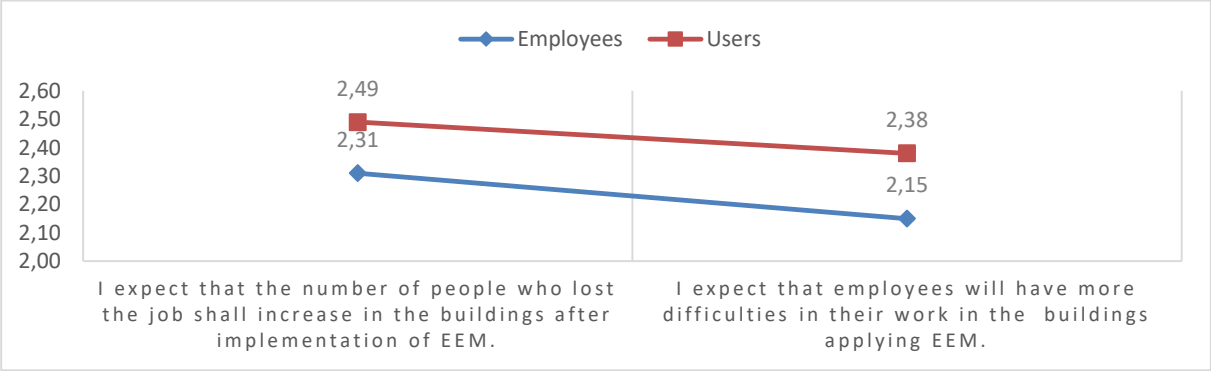


Picture 1.2. Average values of general expectations from EEM impact to living standard of people

By comparing the rank sequence of the average values of the assessed features, the identical ranking has been determined for employees and service users. The most important consequence of EEM pertains to „decrease of energy costs in households and organisations“. The second by importance feature of living standard pertains to perception of positive impact of EEM to economic growth and development, while the third by importance feature of EEM impact pertains to potential for increase of population income. The last by importance perceived feature is that EEM increase the living standard in general.

1.2.3.2. Perception of employees and service users on potential difficulties in work affected by energy efficiency measures

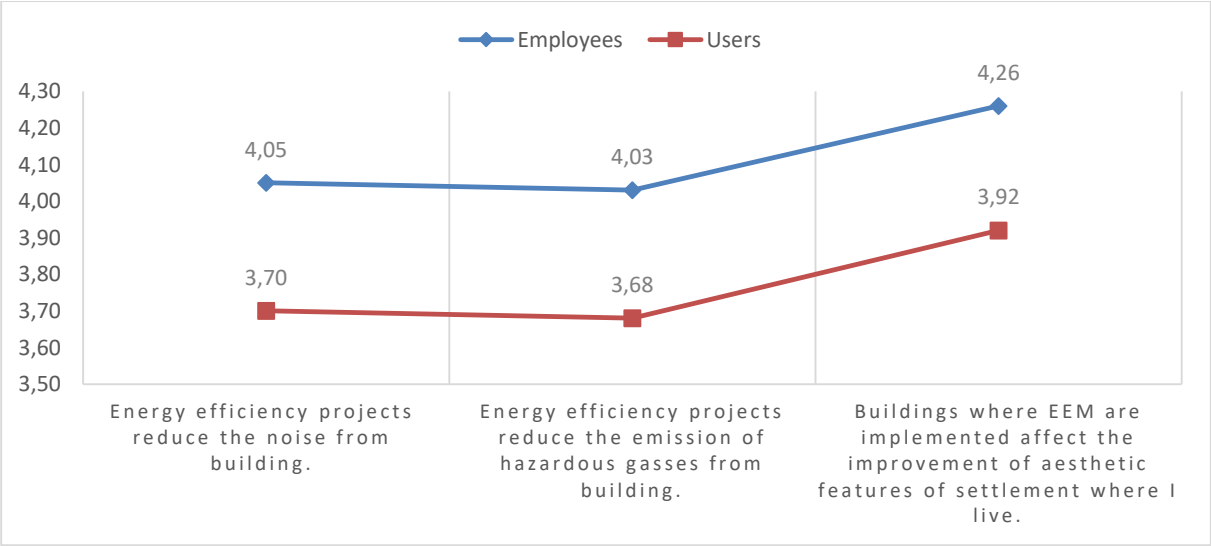
The findings indicate that the respondents mainly considered that EEM shall not increase the potential difficulties at work, in fact that EEM shall not increase the number of people who would lose employment and those employees shall not have more difficulties in their work. The average values of those features are presented in the Picture 1.3. The average grades of expectations of employees and service users that EEM shall increase the number of people losing employment and that employees shall have more difficulties in their work are below the indifferent attitude (below 3). However, compared to other dimensions of gender equality, the average grades of employees regarding those two features are lower compared to the average grades of service users. It means that employees perceive with poorer intensity the potential difficulties at work due to EEM than service users.



Picture 1.3. Average values of potential difficulties at work due to EEM

1.2.3.3. Perception of impact of energy efficiency measures to environment protection

The results confirm that the respondents positively perceived the impact of EEM to environment protection. The average values of the assessed features are presented in the Picture 1.4.



Picture 1.4. Average values of perception of EEM impact to environment protection

By comparing the rank sequence of the average values of the assessed features, the identical ranking has been determined for employees and service users. The most significant impact of EEM pertains to improvement of aesthetic features of settlements where the respondent lives. The following feature by importance pertains to decrease of noise from building, while the last feature by importance pertains to the impact of EEM to reduction of hazardous gases' emission from building.

1.2.3.4. Perception of social cohesion of employees at workplace

Based on the analysis of average values of social cohesion affected by EEM it may be noticed that all of them are below 4, as presented in the Table 1.16. The most important feature of positive social cohesion is „cooperation in work with colleagues“, followed by „increased motivation for participation in decision making“ and „improved social relations among employees“. The poorest grades were given to the feature „conflicts among employees decreased“, which is close to indifferent attitude.

Share of negative expectations from the impact of EEM to social cohesion follows the inverse rank sequence of average values. So, the lowest share of negative expectations is for the feature „cooperation in work with colleagues“ (4,6%), and the highest for the feature „conflicts among employees decreased“ (16,82%). Share of indifferent attitudes for all features is relatively significant. It is the most important for the feature „conflicts among employees decreased“. Share of positive attitudes follows the rank sequence of average values. It is the highest for the feature „cooperation in work with colleagues“, and the lowest for the feature „conflicts among employees decreased“.

Feature	Grade (%)					AV
	1	2	3	4	5	
I am more cooperative in work with colleagues.	2,07	2,53	23,73	46,77	24,88	3,90
I am more motivated to participate in decision making related to my post.	3,46	5,76	30,88	40,32	19,59	3,67
Social relations among employees improved.	4,39	9,47	30,72	39,03	16,40	3,54
Conflicts among employees decreased.	5,53	11,29	40,09	30,41	12,67	3,33

Table 1.16. Relative frequencies and average values of perception of EEM impact to social cohesion of employees

1.2.3.5. Perception of performance of employees affected by energy efficiency measures

Perception of performance of employees affected by EEM is positive, but of different intensity for the assessed features, as presented in the Table 1.17. Share of positive attitudes follows the rank sequence of average values for the same features. After EEM employees feel more comfortable at workplace, their difficulties in performance of work tasks decreased and they are more motivated to earn the salaries. However, the feature that employees are less absent from work after EEM and that they stay longer in the building, although in average are positive, are close to indifferent attitudes. At those two features, the share of negative expectations (grades 1 and 2) and indifferent attitudes are the highest compared to other features.

Feature	Grade (%)					AV
	1	2	3	4	5	
I feel more comfortable at workplace.	2,30	1,38	7,48	43,55	44,93	4,27
Decreased difficulties in performance of tasks.	3,46	4,15	18,43	42,86	31,11	3,94
I stay in the building longer than before.	7,83	13,36	38,48	27,65	12,67	3,24
I am less absent from work.	8,53	16,59	31,80	24,88	18,20	3,28
I am motivated to earn bigger salary.	5,53	8,53	30,18	34,56	21,20	3,57
I feel more productive.	3,46	3,93	24,02	44,11	24,48	3,82

Table 1.17. Relative frequencies and average values of perception of EEM impact to performance of employees

1.2.3.6. Satisfaction with physical features of premises after implementation of energy efficiency measures for employees and service users

Regarding the physical features of premises after implemented EEM, both employees (E) and service users (U) demonstrated the positive level of satisfaction during the heating season, cooling season and inter seasons. The average values of employees' satisfaction in all three seasons for all features have bigger values than of service users. At the same time, the average values of all features decrease if looked at the seasons „heating – inter season – cooling“, for both employees and service users. The most important features of satisfaction for employees and service users in all three seasons are „satisfaction with average air temperature“, „satisfaction with lights“ and „satisfaction with sound insulation“. For employees and service users, in all three seasons, the poorest satisfaction pertains to the features of air in the building: ventilation, quality and humidity of air.

Employees are somewhat more satisfied with energy consumption than with energy costs in building. For these two features the average values decrease if looked at heating season – inter season – cooling season.

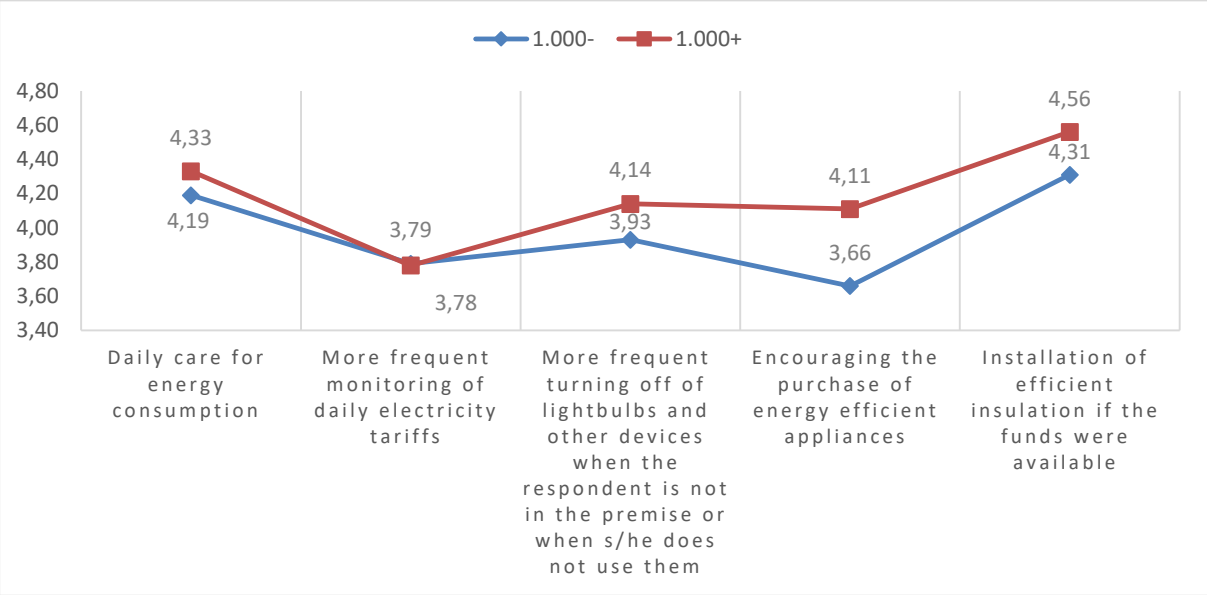
Feature	Sample	AV		
		Heating	Inter season	Cooling
Satisfaction with average air temperature in building.	E	4,18	4,09	3,92
	U	3,82	3,74	3,54
Satisfaction with ventilation in building.	E	3,68	3,65	3,62
	U	3,39	3,37	3,32
Satisfaction with lights in building.	E	3,98	3,93	3,91
	U	3,77	3,72	3,70
Satisfaction with air quality in building.	E	3,87	3,80	3,76
	U	3,46	3,41	3,40
Satisfaction with air humidity in building.	E	3,81	3,76	3,73
	U	3,43	3,42	3,38
Satisfaction with sound insulation in building.	E	3,99	3,95	3,92
	U	3,59	3,50	3,47
Satisfaction with energy consumption in building.	E	3,90	3,87	3,85
Satisfaction with energy costs in building.	E	3,82	3,80	3,78

Table 1.18. Average values of satisfaction with features of premises after implementation of EEM

1.2.3.7. Perception of poverty reduction

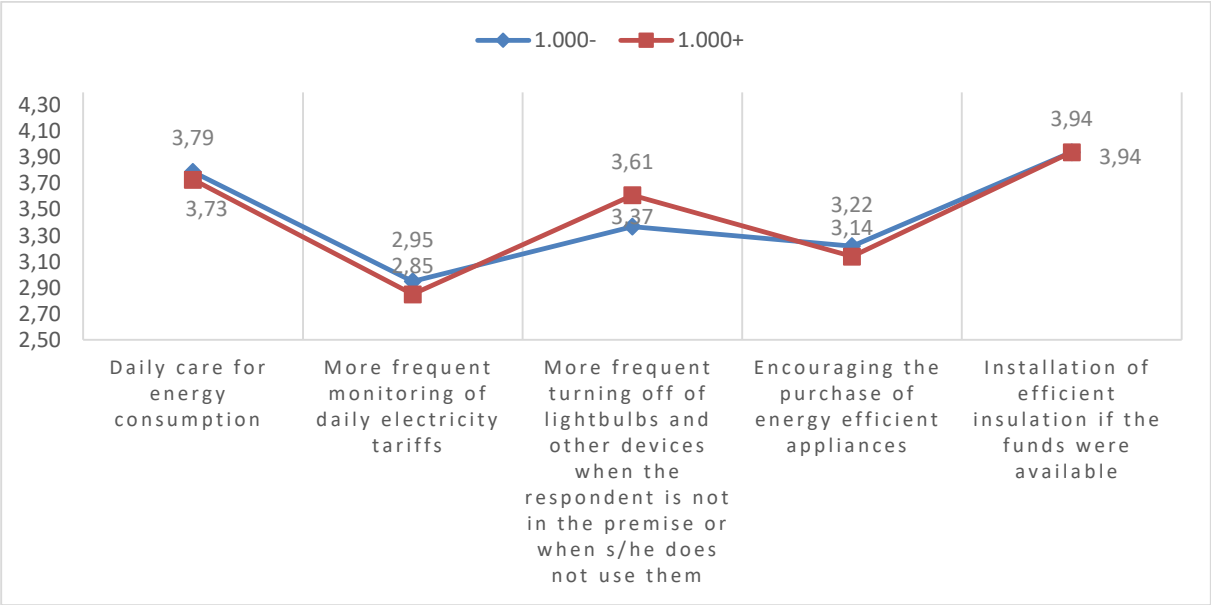
Poverty reduction as decrease of deprivation of certain aspects of human development, in the context of strategic objectives of BiH, takes a significant place. As EEM should influence the development of human capabilities, in the context of poverty reduction, the aspect of daily behaviour aimed at energy saving and perception of potential danger from EEM are important. Therefore, this study addressed per specified aspects the difference in perception of employees and service users with lower (monthly household income below 1.000 KM - stratum „1.000-“) and higher income (monthly household income above 1.000 KM - stratum „1.000+“).

The results indicate that the average values of the feature energy saving behaviour of high-income employees are bigger than of low-income employees, except for the feature more frequent monitoring of daily electricity tariffs (the average value for employees with lower income is slightly bigger). It is presented in the picture 1.5.



Picture 1.5. Average values of EEM impact to behaviour of employees for strata „1.000-“ and „1.000+“

At service users with lower and higher income, the impact of EEM to behaviour aimed at energy saving (Picture 1.6), the grades for certain features are at very high level, such as „more frequent monitoring of daily electricity tariffs“ (in the zone of expectations of negative impact) or „encourage the purchase of energy efficient appliances“ (positive expectation near indifferent attitude). The average values of all other features are below 4. The results confirm that the average values of energy saving behaviour of low-income service users are higher than of high-income service users, except for the feature more frequent turning-off of the lights and other devices/appliances when the s/he is not in the premises or when s/he does not use them. This result is contrary to the result pertaining to employees.



Picture 1.6. Average values of EEM impact to behaviour of employees for strata „1.000-“ and „1.000+“

T-test of independent samples compares the assessment results on impact of energy efficiency knowledge to behaviour of respondents related to energy consumption and energy efficiency between the strata „1.000-“ and „1.000+“, for employees and service users. Between these two strata, for employees, statistically significant difference ($p<0,5$) is found for the feature: „daily care for energy consumption“, „more frequent turning off the light bulbs and other appliances when respondent is not in the premises or when s/he does not use them“ and „encourage purchase of energy efficient (saving) appliances“. However, at these features the size of impact of differences between the strata is small or a bit bigger than small (eta square close to 0,01 or a bit over 0,01). For service users, no statistically significant difference was found for any feature between these two strata.

Considering the features of employees for which statistically significant differences exist between these two strata and average values of those features, which are bigger for the stratum „1.000+“, it may be concluded that the respondents with lower income either have insufficient knowledge on the need to save energy and energy efficiency or their behaviour in this segment is inadequate. This may be explained with inadequate level of knowledge and inadequate understanding of EEM effects. Although for those features the size of differences between the strata is small, since it is the energy that is used on a daily basis, the indication that low income employees are less compliant with energy efficiency than the rich ones, may finally have bigger negative effects to households and the whole economy.

Regarding the difficulties at work due to implementation of EEM, employees and service users with lower income compared to those with bigger income perceive bigger possibility that EEM shall increase the number of people who would lose employment and may increase difficulties in performance of work duties for employees (Pictures 1.7. and 1.8).

Picture 1.7. Average values of perception of employees on potential difficulties for people due to implementation of EEM for strata „1.000-„ and „1.000+“

Picture 1.8. Average values of perception of service users on potential difficulties for people due to implementation of EEM for strata „1.000-„ and „1.000+“

T-test of independent samples compares the results of perception of potential difficulties for people due to implementation of EEM between the strata „1.000-“ and „1.000+“, for employees and service users. Between these two strata, fore employees, there is a statistically significant difference ($p<0,5$) for both features: „increased number of people who would lose job“ and „increased difficulties for employees in performance of their work duties“. However, at these features, the size of impact of differences between the strata is small or small to moderate (eta equals or exceeds 0,01). For service users, statistically significant difference was not found for any feature between these two strata.

The results of the analysis from this chapter confirm that there is a difference in energy saving behaviour of employees and perception of potential difficulties due to implementation of EEM between those with higher income and those with lower income. Therefore, those two groups of results (obtained from employees with lower and higher income) indicate the differences between the employees of those two strata. It would mean that in the context of energy efficiency and poverty reduction, those strata should be approached differently. For service users, no differences have been determined in energy saving behaviour and perception of potential difficulties due to implementation of EEM between those with higher and those with lower income. In the context of energy efficiency and poverty reduction, those strata of service users should be approached similarly.

1.2.3.8. Perception of service users on behaviour of employees after implementation of energy efficiency measures

The results presented in the Table 1.19. indicate that perception of service users on behaviour of employees after implementation of EEM is mainly not satisfactory. The best evaluated is

„responsibility of employees“. The features „kindness of employees“ and „quality of services provided by employees exceeds may expectations“ are close to indifferent attitude.

Based on the distribution of relative frequencies, it may be noticed that the share of negative expectations of features (grades 1 and 2) follows the inverse rank sequence compared to the rank of the average feature values. The rank sequence of share of indifferent attitudes and positive expectations (grades 4 and 5) completely follows the rank sequence of the average feature values. However, it is evident that the share of indifferent attitudes for all three features is relatively high, while the share of positive attitudes (grades 4 and 5) is below 50% for the feature „kindness of employees“ and „quality of services provided by employees exceeds my expectations“.

	Grade (%)					
Feature	1	2	3	4	5	AV
Quality of services provided by employees exceeds my expectations.	11,33	13,24	38,57	25,87	11,30	3,13
Employees are kind when providing services.	7,69	12,24	37,12	29,30	14,65	3,32
Employees are responsible when providing services.	5,82	7,42	29,88	35,83	21,06	3,59

Table 1.19. Relative frequencies and average values of users' perception on impact of EEM to behaviour of employees

1.2.3.9. Perception of service quality improvement by employees and service users after implementation of EEM

Improvement of service quality, in the context of energy efficiency, is the subjective evaluation of respondents on how the services, after implemented EEM met or exceeded the expectations of users in terms of better performances. As the study covered two target groups: employees and service users, the improvement of service quality from the aspect of both target group was assessed, in the period of heating season (15.10.-15.04), inter season (16.04.-14.06. and 16.09.-14.10) and cooling season (15.06.-15.09.) in public buildings per their types. Generally for all buildings in all seasons, the obtained results indicate the improved quality of services after implementation of EEM.

- **Improvement of service quality in hospitals**

Improvement of services in hospitals after implementation of EEM is given in the Table 1.20. Based on the average values of responses given by employees and service users in terms of service quality after implementation of EEM in hospitals, the improvements have been noticed in almost all features in all three seasons. The lowest grades were given to the feature „decreased time for provision of different medical services“, but all average grades for employees and service users in all three seasons were closer to 4 than to indifferent attitudes. The most important two features for employees and service users in all three seasons were „patients feel more comfortable in building“ and „bigger comfort for recovery of patients“. In heating and inter season, the average grades of employees for majority of features were higher than the average grades of service users except for the feature „decreased time for provision of different medical services“ (in heating season) and „patients are less nervous“ (in heating and inter season). However, in cooling season, the average

grades of users compared to employees are higher, except for the feature „patients feel more comfortable in building“ which are equal for both groups.

Feature	Sample	AV		
		Heating	Inter season	Cooling
Patients feel more comfortable in building.	E	4,47	4,09	3,91
	U	4,19	3,91	3,91
Bigger comfort for recovery of patients.	E	4,41	4,16	3,94
	U	4,26	3,93	4,02
Patients are less nervous.	E	3,94	3,84	3,66
	U	4,05	3,93	3,84
Decreased time for provision of different medical services.	E	3,66	3,75	3,56
	U	3,70	3,51	3,65
Increased quality of services.	E	3,97	4,00	3,78
	U	3,91	3,84	3,91
Decreased number of patients' appeals	E	4,06	4,13	3,84
	U	3,79	3,81	3,91

Table 1.20. Average values of service quality perception by employees and service users after implementation of EEM in hospitals

- **Improvement of service quality in health centres**

In health centres after implementation of EEM, the quality of services improved, which may be seen in the average values presented in the Table 1.21. Users and employees perceive the best the feature „bigger comfort for recovery of patients“ and „patients feel more comfortable in building“. It may be noticed that employees compared to service users gave bigger grades to all features of service quality in all three seasons (except for the feature „patients feel more comfortable in building in the cooling season“). The average grades of employees and service users are the biggest for all features in the heating season, followed by the average grades for inter season, while the grades for the cooling season are the lowest. All average grades of service users, for all features, except for the feature „patients feel more comfortable in building in the cooling season“, and for all seasons range from 3,50 to 3,98. At the same time, during the cooling season, the employees gave average grades for all features below 4.

Feature	Sample	AV		
		Heating	Inter season	Cooling
Bigger comfort for patient.	E	4,44	4,28	3,84
	U	3,98	3,71	3,69
Less nervousness in waiting rooms.	E	4,20	3,96	3,76
	U	3,82	3,58	3,63
Less appeals by patients.	E	4,16	4,08	3,80
	U	3,74	3,50	3,55
Patients feel more comfortable in building.	E	4,16	3,92	3,80
	U	4,11	3,85	3,84
Decreased time of provision of services.	E	3,88	4,00	3,88
	U	3,61	3,52	3,35
Increased quality of services.	E	4,08	4,08	3,96

	U	3,95	3,84	3,77

Table 1.21. Average values of service quality perception by employees and service users after implementation of EEM in health centres

- **Improvement of service quality in culture institutions**

Improvement of service quality in culture institutions after implementation of EEM is given in the Table 1.22. Based on the average values for all features, both employees and service users believe that service quality has improved. All average values for employees are above 4, while the average values for service users are mainly below 4, except for the feature „decreased number of users' appeals“ and „increased quality of services“. For all features and all season the average grades given by employees are higher than the grades given by service users.

Feature	Sample	AV		
		Heating	Inter season	Cooling
Users feel more comfortable in building.	E	4,40	4,20	4,00
	U	3,63	3,38	3,38
Bigger comfort for users.	E	4,80	4,20	4,00
	U	3,75	3,63	3,75
Decreased number of users' appeals.	E	4,20	4,60	4,40
	U	3,63	3,63	4,38
Increased quality of services.	E	4,60	4,80	4,60
	U	3,63	3,75	4,00

Table 1.22. Average values of service quality perception by employees and service users after implementation of EEM in culture institutions

- **Improvement of service quality in sport institutions**

In sport institutions, after implementation of EEM, service quality improved, which may be seen in the average values presented in the Table 1.23. The most significantly evaluated features by service users in the heating season are „decreased number of appeals by user“ and „increased quality of services“, while in the cooling season those are the features „decreased number of users' appeals“ and „users feel more comfortable in building“. The employees gave the highest grades for all three seasons to the feature „users feel more comfortable in building“. In the heating season, the average grades of service users are higher than the average grades of employees, while for majority of features in inter season and cooling season, the average grades given by employees are higher than the average grades given by service users.

Feature	Sample	AV		
		Heating	Inter season	Cooling
Users feel more comfortable in building.	E	4,20	4,60	4,60
	U	3,80	4,00	4,20
Bigger comfort for users.	E	3,60	4,20	4,40
	U	3,60	3,80	3,80
Decreased number of users’ appeals.	E	3,60	3,80	4,20
	U	4,60	3,40	4,20
Increased quality of services.	E	3,80	3,60	4,40
	U	4,40	3,60	3,40

Improved health of users.	E	3,60	4,00	4,40
	U	3,80	3,80	3,80

Table 1.23. Average values of service quality perception by employees and service users after implementation of EEM in sport institution

- **Improvement of service quality in public administration**

Improvement of service quality in public administration after implementation of EEM is given in the Table 1.24. The quality of services mainly improved. This is significant for the features „citizens feel comfortable in building“ and „bigger comfort for citizens“ in all three seasons, for both, employees and service users. The poorest grades were given by employees and services users to the feature „decreased time of service provision“ (for service users it is close to indifferent attitude) for all three seasons. Anyway, per all features and for all seasons, the employees perceive more significantly the improvement of service quality in all three seasons than the service users.

Feature	Sample	AV		
		Heating	Inter season	Cooling
Less nervousness at window tellers.	E	3,94	3,74	3,58
	U	3,52	3,48	3,27
Less appeals by citizens to the work of employees.	E	3,77	3,71	3,58
	U	3,42	3,39	3,36
Citizens feel comfortable in building.	E	4,26	4,10	3,68
	U	3,91	3,79	3,61
Bigger comfort for citizens.	E	4,26	4,03	3,71
	U	3,94	3,85	3,67
Decreased time of service provision.	E	3,65	3,52	3,32
	U	3,14	3,15	3,09
Increased quality of services.	E	4,03	3,90	3,68
	U	3,45	3,42	3,21

Table 1.24. Average values of service quality perception by employees and service users after implementation of EEM in public administration

- **Improvement of service quality in schools for children with special needs**

In schools for children with special needs, after implementation of EEM, the quality of services improved, which may be seen in the average values presented in the Table 1.25. It may be noticed that for all features in all three seasons the average grades of service users were higher than the average grades of employees. At the same time, for all features, the average values decrease or stagnate if looking at heating season – inter season – cooling season, for both, employees and service users. For service users the most important features in all three seasons are „improved quality of lessons“, „better use of all school premises“ and „students feel more comfortable while staying in school“. For employees the most important features in the heating season are „improved quality of lessons“, „better use of all school premises“ and „students feel more comfortable while staying in school“ (this feature is the most important in inter season and cooling season).

Feature	Sample	AV		
		Heating	Inter season	Cooling
Students feel more comfortable while staying in	E	4,40	4,20	3,80

school.	U	4,70	4,70	4,60
Improved quality of lessons.	E	4,40	4,00	3,80
	U	4,80	4,70	4,60
Students are more active at lessons.	E	4,00	3,80	3,60
	U	4,50	4,40	4,40
Students achieve better results.	E	3,80	3,60	3,40
	U	4,50	4,40	4,40
Improved health of students which results with decrease of absences in general.	E	4,40	4,00	3,80
	U	4,50	4,50	4,50
Better use of all school premises.	E	4,60	4,20	3,60
	U	4,80	4,70	4,70

Table 1.25. Average values of service quality perception by employees and service users after implementation of EEM in school for children with special needs

- **Improvement of service quality in schools**

Improvement of service quality in schools after implementation of EEM is given in the Table 1.26. The quality of service mainly improved. It may be noticed that for all features in all three seasons, the grades given by employees are higher than the grades given by service users. At the same time, for all features, the average values decrease looking at heating season - inter season – cooling season, for both, employees and service users. All average values for features for students are below 4 and most of them are over 3,5. For employees and students in all three seasons, the most important features are „students feel more comfortable while staying in school“, „better use of all school premises“ and „improved quality of lessons“.

Compared to the features of service quality in other institutions (excluding faculties) the features of improved service quality in schools are worse perceived by employees and students. Those results are the consequence of relatively high share of indifferent attitudes in the responses of employees (in average about 25%) and students (in average about 35%), which may be interpreted as their insecurity or lack of interest.

Feature	Sample	AV		
		Heating	Inter season	Cooling
Students feel more comfortable while staying in school.	E	4,25	4,05	3,88
	U	3,98	3,69	3,40
Improved quality of lessons.	E	4,07	3,92	3,86
	U	3,71	3,57	3,41
Students are more active at lessons.	E	3,83	3,77	3,67
	U	3,43	3,34	3,23
Students achieve better results.	E	3,69	3,63	3,56
	U	3,43	3,32	3,22
Improved health of students which results with decrease of absences in general.	E	3,91	3,85	3,76
	U	3,60	3,46	3,41
Better use of all school premises.	E	4,14	4,05	3,93
	U	3,67	3,59	3,54

Table 1.26. Average values of service quality perception by employees and service users after implementation of EEM in schools

- **Improvement of service quality in faculties**

At the assessed faculty, after implementation of EEM, the quality of service improved relatively, which may be seen in the average values presented in the Table 1.27. All average values for both, employees and service users are below four, and many of them are close to indifferent attitude (below 3,5). The most important features for employees and student in all three seasons are „students feel more comfortable while staying at faculty“, „better use of all faculty premises“ and „improved quality of lessons“ (similar to schools). Compared to the features of service quality in other institutions, features of improved service quality at the faculty are perceived the worst by employees and students. Those results pertaining to employees may be explained by small sample size (17 respondents) and exceptionally high share of indifferent attitudes in responses (in average about 45%). At students, there are also lots of indifferent attitudes in responses (in average about 40%). This may be interpreted as insecurity or lack of interest of both, employees and students.

Feature	Sample	AV		
		Heating	Inter season	Cooling
Students feel more comfortable while staying at faculty.	E	3,53	3,71	3,76
	U	3,71	3,76	3,54
Improved quality of lessons.	E	3,47	3,59	3,65
	U	3,41	3,33	3,29
Students are more active at lessons.	E	3,18	3,29	3,35
	U	3,30	3,24	3,13
Students achieve better results.	E	3,35	3,47	3,47
	U	3,24	3,17	3,07
Improved health of students which results with decrease of absences in general.	E	3,29	3,41	3,41
	U	3,41	3,36	3,33
Better use of all faculty premises.	E	3,47	3,65	3,53
	U	3,37	3,47	3,46

Table 1.27. Average values of service quality perception by employees and service users after implementation of EEM at faculty

- **Improvement of service quality in all-day accommodation & nursing centres**

Improvement of service quality in all-day accommodation & nursing centres after implementation of EEM is given in the Table 1.28. The quality of services mainly improved significantly. It may be noticed that the average grades for all features (except for one) in all three seasons are higher for users than employees. In heating and cooling season it pertains to all features, while in inter season the exception is the feature „improved health of users“. For service users, the most important features in all three seasons are „improved health of users“, „users feel more comfortable in building“ and „decreased number of users' appeals“. For employees also the most important features are „improved health of users“, „decreased number of users' appeals“ and „users feel more comfortable in building“.

Feature	Sample	AV		
		Heating	Inter season	Cooling
Users feel more comfortable in building.	E	3,93	4,20	4,07
	U	4,64	4,55	4,55
Bigger comfort for users.	E	3,93	4,07	3,87

	U	4,36	4,64	4,36
Decreased number of users' appeals.	E	4,07	4,07	4,07
	U	4,45	4,64	4,55
Better socializing between the users.	E	3,87	4,00	4,00
	U	4,36	4,45	4,36
Increased quality of service.	E	4,00	3,93	4,20
	U	4,27	4,36	4,27
Improved health of users.	E	4,10	4,50	4,00
	U	4,64	4,45	4,45

Table 1.28. Average values of service quality perception by employees and service users after implementation of EEM in all-day accommodation & nursing centres

- **Improvement of service quality in kindergartens**

In kindergartens, after implementation of EEM, the quality of services improved, which may be seen in the average values presented in the Table 1.29. For employees and service users, all average grades for all features and all seasons are above 4. Employees mainly perceive more importantly all features than the users. In inter season, the users perceive higher than employees the importance of the features „in winter period, children are less absent from kindergarten" and „due to implemented energy efficiency measures parents are more satisfied", and in the cooling seasons the feature „children feel more comfortable while staying in kindergarten".

Feature	Sample	AV		
		Heating	Inter season	Cooling
Children feel more comfortable while staying in kindergarten.	E	4,40	4,29	4,22
	U	4,40	4,27	4,25
Children are more active.	E	4,48	4,33	4,26
	U	4,17	4,17	4,22
Due to implemented energy efficiency measures parents are more satisfied.	E	4,53	4,31	4,41
	U	4,44	4,35	4,41
Improved health of children which results with decrease of absences in general.	E	4,33	4,21	4,21
	U	4,19	4,17	4,13
Better use of all premises in kindergarten.	E	4,48	4,34	4,40
	U	4,30	4,22	4,30
Improved quality of educational process.	E	4,39	4,32	4,30
	U	4,22	4,05	4,06

Table 1.29. Average values of service quality perception by employees and service users after implementation of EEM in kindergartens

1.3. Transparency and responsibility mechanisms

Implemented EEM projects in public buildings included in certain phases different stakeholders. In addition to UNDP that coordinated all the activities, participation of the institution itself is significant, including different state institutions, energy auditors and similar. Therefore, achievement of rights within transparency included two key segments: aspect of project and institution and aspect of key stakeholders (employees and service users). At the same time, responsibility mechanisms are included from the aspect of public institution for all individual phases of EEM implementation.

Generally, the study results indicate that the EEM project in certain segments was not implemented in accordance with the principles of full transparency, neither in terms of access to the programme nor during the programme implementation. Similar implications apply to responsibility mechanisms, as well as involvement of employees and service users in implementation of EEM. This is mainly due to very complex structure and political functioning of BiH, where the programmes coordinated by the state, regardless their effects in local communities, by involving the lower government institutions (entity, cantonal, municipal levels) in decision making on different procedures, affect the transparency of their implementation.

1.3.1. Analysis of transparency of the EEM implementation from the aspect of institution

From the aspect of public institutions involved in EEM programme, the internal preparations of the institution for implementation of EEM, nomination of institution and its measures and selection of specific EEM and institution were not conducted in the same way. At the same time, the importance of different external stakeholders in those activities were identified and evaluated differently by the management of target public institutions.

Different internal and external stakeholders initiated inclusion of a public institution into EEM programme. The institutions and their employees, city/municipality, relevant ministries, UNDP, Environmental Fund and similar institutions significantly participated in initializing the EEM activities. While planning specific EEM, enormous support was provided by the relevant ministries, city/municipality, energy auditor, external designer as well as employees of the institution.

Public institutions, in terms of access to the EEM programme with their specific projects, did not apply the same procedures. Some institution accessed this programme based on the public call or call published by UNDP, relevant ministry or Environmental Fund, while the others only received a notice from UNDP, government/relevant ministry, city/municipality, Environmental Fund, etc. Selection of specific public institution and its EEM was not conducted identically for all public institutions either, but the selection was done by external institutions which provided the public institution to access the programme. Selection criteria for institutions where EEM would be implemented were not clear to the management in even 34% of public institutions.

Regarding the problems in implementation of EEM, 14,6% said that they faced the problems. Most of those problems pertained to contractors, quality of installed material and equipment and conducted labour. In 8,5% institutions, there were conflicts and complaints during implementation of EEM. Appeals and complaints pertained mainly to the quality of equipment and conducted labour. There were conflicts with the owners of nearby buildings and appeal was lodged to the court against one school by the company that used to provide for the heating there earlier.

Participation of employees and service users in planning and implementation of specific EEM and planning of future EEM was recognised by the management. The role of employees in initialization and planning of specific EEM in certain number of institutions was much emphasised, while participation of service users in those activities was mainly through the representative bodies in institutions, such as schools boards, etc.

1.3.2. Analysis of responsibility mechanism from the aspect of institution

Regarding the responsibility mechanisms in all implementation phases of energy efficiency project (planning, selection of the specific project, labour, supervision of labour, technical handover of building and use of building), for management of majority of public buildings they were clearly defined and understandable, as presented in the Table 1.29. However, some directors did not understand in certain phases who was the responsibility stakeholder and what mechanisms were available.

Phase	Positive response		Negative response	
	f	%	f	%
Planning	72	91,14%	7	8,86%
Selection of specific project	71	89,87%	8	10,13%
Labour	71	89,87%	8	10,13%
Supervision of works	71	89,87%	8	10,13%
Technical handover of building	68	86,08%	11	13,92%
Use of building	73	92,41%	6	7,59%

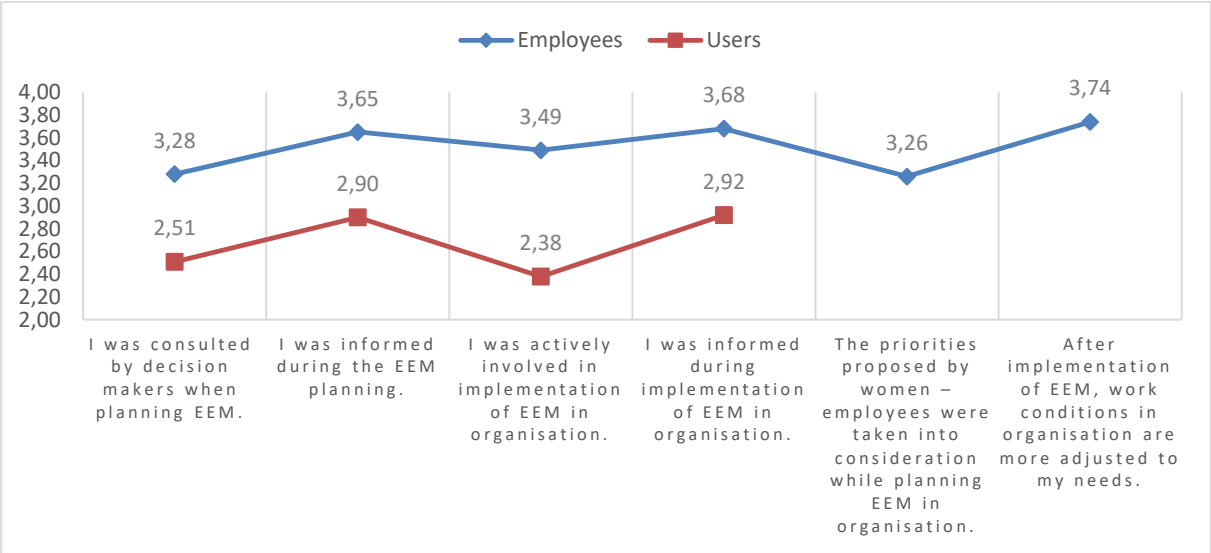
Table 1.29. Understanding the mechanisms of management responsibility during implementation of EEM

1.3.3. Analysis of transparency in implementation of energy efficiency measures in public buildings from the aspect of employees and service users

During implementation of EEM, the participation of employees and service users was important, as they are the most significant stakeholders from public institutions. Therefore, the involvement of employees and service users in planning and implementation of EEM in specific building is analysed, as well as their involvement in planning of future EEM.

Based on the information on average value of employees and service users' involvement in planning and implementation of EEM in specific building (Picture 1.9), in which they are the stakeholders, significantly bigger involvement of employees may be determined compared to the service users in all aspects of planning and implementation of specific EEM. The average value of employee's involvement is higher than indifferent attitude, while the average values for the service users are below indifferent attitude. There is a relatively important share of indifferent attitudes here, particularly at employees, which may be interpreted by opportunistic attitude as the lowest risk and lack of interest.

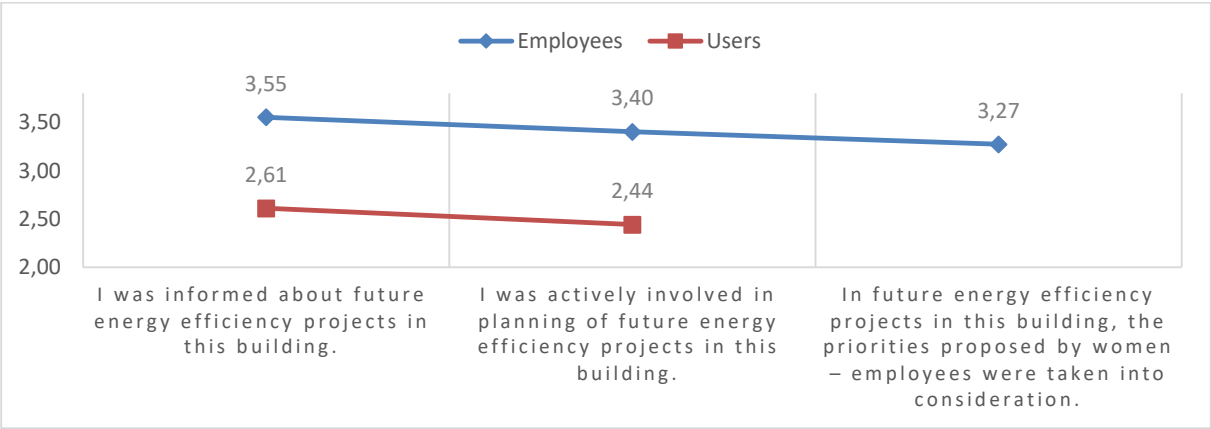
Over 63% employees were informed during planning and implementation of EEM, while 55% of them were actively involved in implementation of EEM. However, less than 50% employees said that they were consulted prior to making decision on EEM, while 41% employees believed that the priorities proposed by women – employees were considered. If the last feature is considered in the context of indifferent attitudes and negative expectations, the role of women in their specific need has not been adequately addressed in the process of EEM planning.



Picture 1.9. Average values of involvement of employees and service users in planning and implementation of specific EEM

For service users as well the biggest average values pertain to being informed about planning and implementation of EEM in specific building. Although the average values of services users' participation in planning and implementation of EEM are below the indifferent attitude, about 37% service users were informed about planning and implementation of EEM, which is acceptable share. There were even 20,64% actively involved users in the project implementation.

Based on the analysis of average values of employees and service users involvement in further activities on EEM in specific building (Picture 1.10.), much higher involvement of employees compared to service users may be determined in all aspects of further activities on EEM in specific building. For employees and service users, important aspect of involvement pertains to information compared to active involvement. The average values of employees are above the indifferent attitude, while the same for service users are below the indifferent attitude. For employees, the lowest grades were given to considering the priorities proposed by women - employees. Positive perception of employees' involvement in further EEM activities is about 50%, which is acceptable level. For service users, positive perception of this involvement is much lower (about 20-25%), but considering their position in the institution, this share is acceptable.



Picture 1.10. Average values of involvement of employees and service users in planning and implementation of EEM in specific building

One-way analysis of variance (ANOVA) assessed whether the results of perception of transparency in implementation of EE measures and planning of further EEM were different for employees and service users for the groups of respondents established based on different modalities: post, highest educational degree, type of respondent's residential building and place of respondent's residence.

ANOVA results on transparency in implementation of specific EEM project indicate the significant difference was determined between different groups of employees in perception of the following features related to the post ($p<0,05$): „decision makers consulted me when planning the energy efficiency measures", „I was actively involved in implementation of energy efficiency measures in organisation" and „I was informed during implementation of energy efficiency measures in organisation". Regarding the educational degree between the employees group, no statistically significant difference was determined for any transparency feature, while in the group of service users statistically significant difference was determined in perception of the following features: „decision makers consulted me when planning the energy efficiency measures", „I was informed during implementation of energy efficiency measures in organisation" and „I was actively involved in implementation of energy efficiency measures in organisation". Looking at the groups of employees and service users compared to the type of building they live in, no statistically significant difference was found for any feature, except for perception of service users' feature: „I was informed during implementation of energy efficiency measures in organisation". Between different groups of employees, compared to the type of settlement they live in, statistically significant differences were found in perception of the following features: „I was informed during implementation of energy efficiency measures in organisation" and „the priorities proposed by female employees were taken into consideration in planning of energy efficiency measures in organization". For service users, between different groups compared to the type of settlement, statistically significant differences were found in perception of the following features: „decision makers consulted me when planning the energy efficiency measures" and „I was actively involved in implementation of energy efficiency measures in organisation".

ANOVA results on transparency of further EEM activities in specific buildings indicate the significant differences in perception of all features (being informed about future projects, active involvement in planning and consideration of priorities proposed by women – employees) between different groups of employees related to the post. At employees, there are no significant differences between the groups related to the educational degree, building where they live and their place of residence. However, at service users, significant differences were determined between different groups related to the educational degree, building where they lived and type of settlement of their residence, in perception of all features pertaining to involvement of the users in further EEM activities (being informed about future projects and active involvement in planning of future projects).

ANOVA results may have important implications in the context of transparency and participation of employees and service users from different groups related to the post, educational degree, type of building where they lived, in planning and implementing specific EEM, as well as planning further EEM activities in specific building.

2. GENDER EQUALITY IN IMPLEMENTATION OF ENERGY EFFICIENCY MEASURES

The problems of gender equality in BiH have been in the focus of interest of different structures aimed at identifying the obstacles and finding the procedures for improvement of the situation in that segment. It is of a particular importance that this issue is assessed within different segments of social life. Therefore, particular contribution of this study is that gender equality is analysed from the aspect of implemented EEM in public buildings.

Generally, the role of women in BiH in economic, political and private life is still looked at traditionally, which leads to the emphasised dependence of women from men. In that sense, women are politically less active, they see their family responsibility as a crucial role in the society and they are less aware of their human rights. At the same time, they are less present at the labour market. However, lately, the situation has significantly improved, particularly in the segment of education and participation of female population at the labour market. The results of the recent study GENDER ANALYSIS REPORT FOR BOSNIA AND HERZEGOVINA implemented within the USAID-MEASURE-BiH project in 2016 are particularly interesting.[1]

In that study, the focus was on the key causes to gender inequality identified while preparing the five-year Country Development Cooperation Strategy – CDCS for BiH. The study presents the most important statistical indicators of gender discrimination within the sector and evaluates the status of women and men in key sector policies and institutional practices, as well as cultural standards and beliefs. Particular attention was paid to gender roles, responsibilities, time devoted to different activities, access and control of funds allocation, as well as existing patterns of power distribution and influence to decision making.

Regarding the above mentioned, particularly important is to analyse the gender equality issue in different segments of BiH society. To evaluate the effects of EEM to gender, the attitudes of employees and service users of the assessed institutions have been identified. For the study purposes, general attitudes of total population, as well as separate attitudes of male and female population were analysed. For employees, male population included 178 (40,83%), and female 258 (59,17%) respondents, while for users there were 702 (47,05%) male and 790 (52,95%) female respondents. Gender equality in planning, implementation and continuation of the activities on implementation of EEM was particularly analysed.

The following key gender dimensions have been identified:

- Gender discrimination gap in the segment of EEM for employees and service users,
- Gender equality in implementation of specific EEM for employees and service users and
- Gender equality in achievement of equal benefits from specific EEM for employees and service users.

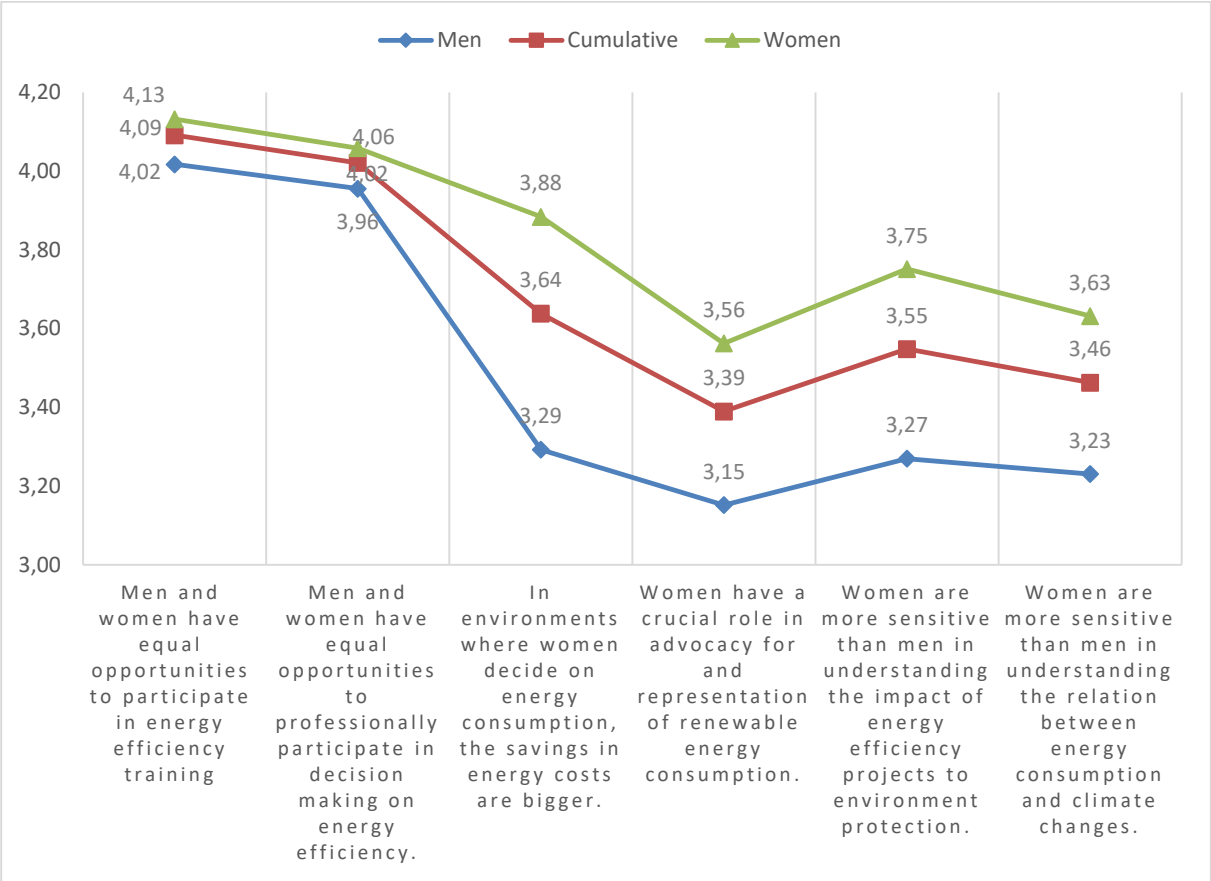
[1] GENDER ANALYSIS REPORT FOR BOSNIA AND HERZEGOVINA, November 2016 (http://www.measurebih.com/uimages/Edited20GA20Report20MEASURE-BiH.pdf

2.1. Gender discrimination gap in the segment of energy efficiency measures for employees and service users

Dimension pertaining to gender equality in terms of possibility for achievement of right to energy efficiency training is evaluated on the basis of perception of respondents for cumulative population and separately for male and female population. Similarly, the possibility for achievement of rights related to labour market was analysed through evaluation of opportunities for professional engagement in the segment of energy efficiency. To evaluate prevention of gender discrimination, the level of women empowerment to take part in the energy efficiency projects was evaluated. In that purpose, the attitudes of the respondents were collected about the role of women in different activities related to energy efficiency. The questions were about: participation in decision-making about the activities reducing energy costs, advocacy for and representation of renewable energy consumption, understanding the impact of EEM to environment protection and understanding the relation between energy consumption and climate changes. All questions were asked to both, employees and service users.

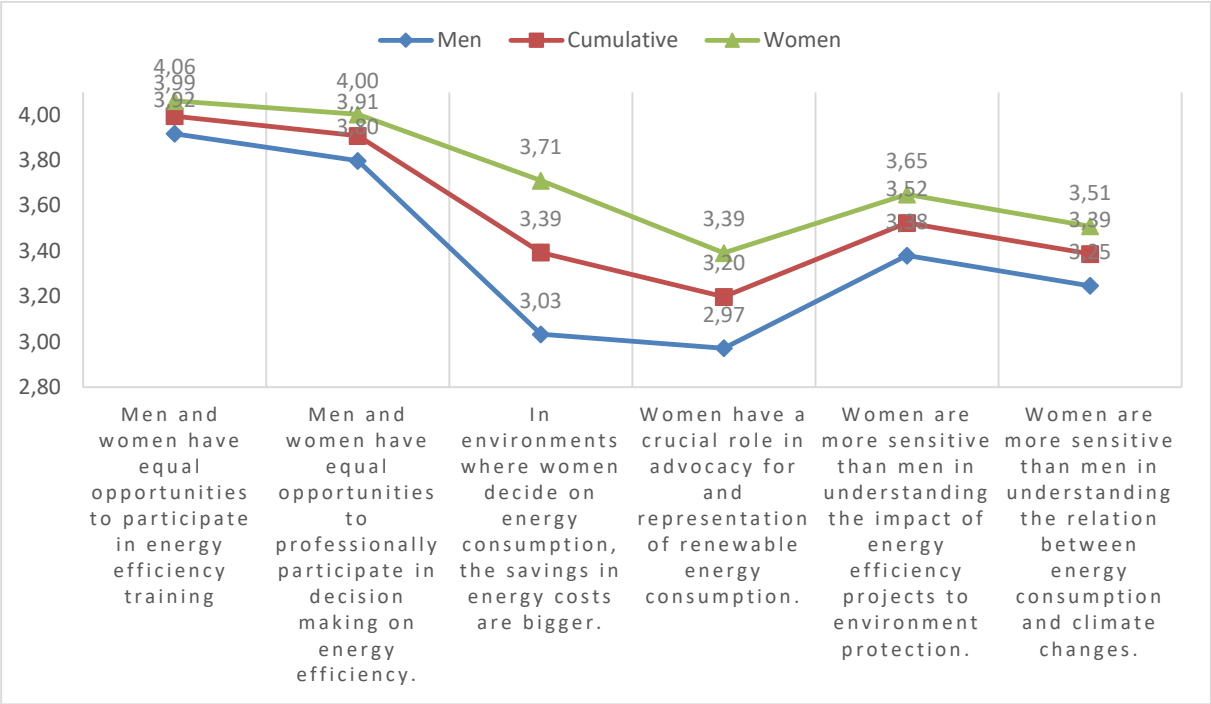
By summarizing the replies of the respondents, the dominance of positive attitudes to gender equality, particularly related to the opportunities for participation in energy efficiency education and opportunities for professional participation in decision-making related to energy efficiency may be noticed at both, employees and users. Indifferent attitudes are dominant at evaluation of justification of women participation in decision making on energy consumption in terms of increased saving in energy costs, role of women in advocacy for and representation of renewable energy consumption, higher sensitivity of women than men in understanding the impact of energy efficiency projects to environment protection and relation between energy consumption and climate changes.

If the previous attitudes are looked separately depending on the gender of respondent, the data summarized in the Picture 2.1 for employees and the Picture 2.2 for service users are obtained. The pictures graphically present the average grades for cumulative population, as well as per gender of respondent.



Picture 2.1. Average grades of employees for impact of EEM to gender equality, cumulative and per gender of respondent

The previous picture shows that the perceived attitudes on impact of EEM to gender equality are more positive at female than at male population particularly in terms of the grades on participation of women in decision-making on energy consumption in sense of increased saving in energy costs, role of women in advocacy and representation of renewable energy consumption, higher sensitivity of women than men in understanding the impact of energy efficiency projects to environment protection and relation between energy consumption and climate changes. Considering the average grades, it may be concluded, when it comes to the opportunities for energy efficiency training and professional participation in decision-making on energy efficiency, that gender equality is highly present with average grades from 3,96 to 4,13. In addition, female population of employees has perceived better general attitudes to gender equality than male population, particularly in last four indicators.



Picture 2.2. Average grades of services users on impact of EEM to gender equality, cumulatively and per gender of respondent

The picture 2.2 confirms the previous conclusions for users as well, in terms of the average grades for first two indicators, as well as better average grades at female than male population. On the other side, it may be noticed that for the users, almost all indicators of average grades are lower than for the employees, and the biggest difference is in the third (0,26 for male and 0,18 for female population) and the fourth (0,17 for both populations) indicator. In addition, for the users, the increase of differences in average grades between male and female population may be noticed in first four indicators, as well as decrease of differences in the remaining two indicators.

Therefore, the conclusion is that there is a gender discrimination gap in perception of EEM impact to gender equality and role of women in energy consumption between the stratum of women, employees and service users, and the stratum of men, employees and service users. In all features of gender equality and role of women in energy consumption and EEM, perceptions of the stratum of women are more significant than perceptions of the stratum of men, in both, the employees sample and the service users sample. Obviously, women have better sense of rational use of resources while applying EEM and contribute more to the advocacy for and presentation of renewable energy consumption.

By T-test of independent samples, the results of gender discrimination gap assessment were compared in the segment of EEM, stratum of men and stratum of women, separately for employees and service users. For $p<0,05$ there is a significant difference between the average values of features between men and women. The effects of impact size were measured by eta square, and the obtained values are interpreted as follows: small impact (eta=0,01), moderate impact (eta=0,06) and big impact (eta=0,14).

T-test of independent samples compared the assessment results of equal access to energy efficiency training and professional participation in decision making on energy efficiency by men and women.

For employees, for both features, no statistically significant differences in results of men and women were found (p>0,05). However, for service users, statistically significant differences were found between men and women (p<0,05) regarding perception of equal access to energy efficiency training and professional participation in decision making on energy efficiency. The difference between the average values of those two features between the stratum of men and the stratum of women, for both, employees and service users, is very small or small (eta below 0,01).

As for the T-test results regarding the assessment of the role of women in different activities related to energy consumption and energy efficiency (from third to sixth feature), by comparing the assessment results for men and women, significant differences between the average values for all features were determined for the stratum of men and the stratum of women, for both, employees and service users (p<0,05). Men and women, employees and service user are statistically different in perception of the following features:

- In environments where women decide on energy consumption, savings in energy costs are higher.
- Women play a crucial role in advocacy for and representation of energy use from renewable sources.
- Women are more sensitive than men when it comes to understanding the impact of energy efficiency to environment.
- Women are more sensitive than men when it comes to understanding the relation between energy consumption and climate changes.

Based on the obtained "eta square" values, it was determined that gender differences have a small impact, ranging from small to moderate impact, to most of the addressed features regarding the role of women in different activities related to energy consumption and energy efficiency, except for the feature „ in environments where women decide on energy consumption, savings in energy costs are higher", where this impact ranges from moderate to big. This applies to both, employees and service users.

Based on the T-test results, it may be concluded that regarding the perception of access to energy efficiency training and professional participation in decision-making on energy efficiency, there are no gender differences between men and women for employees, while for service users the differences have been found between men and women in both features. On the other side, it was determined that men and women in both population groups, employees and service users, are significantly different in perception of the role of woman in different activities pertaining to energy consumption, energy efficiency and environment protection.

2.2. Gender equality in implementation of specific energy efficiency measure for employees and service users

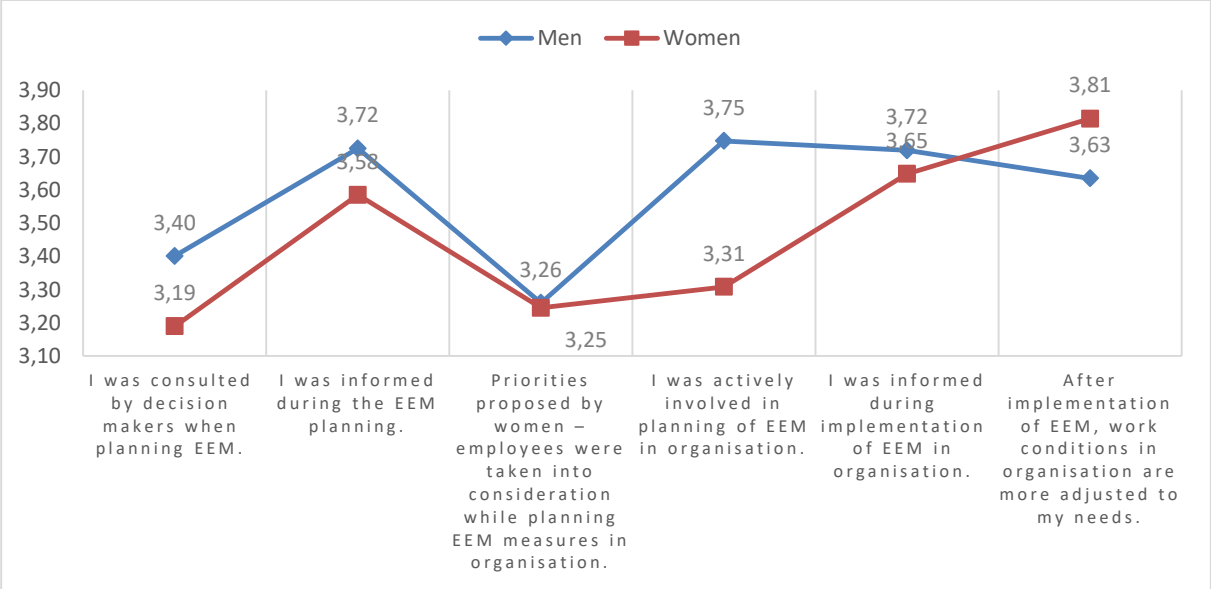
Gender equality of employees and service users was analysed in the context of perception of their participation in planning and implementation of EEM and further activities on energy efficiency projects in specific building.

2.2.1. Analysis of gender equality in approach to planning and implementation of specific energy efficiency measures

Gender equality of employees and users in terms of specific EEM implemented in the assessed institutions is evaluated on the basis of the attitudes of respondents particularly for the phases of planning, implementation, exploitation of specific EEM, as well as planning of future EEM. For the planning phase, the attitudes to gender equality in consultation by decision-makers, level of information and inclusion of priorities proposed by female employees were assessed. For implementation phase, gender equality in active involvement and information were assessed, while in exploitation phase the compliance of terms of work in the institution with the needs of respondents after implementation of EEM measure were assessed. In that purpose, the employees were asked six questions, while the users were not asked the third and the sixth question pertaining to employees only.

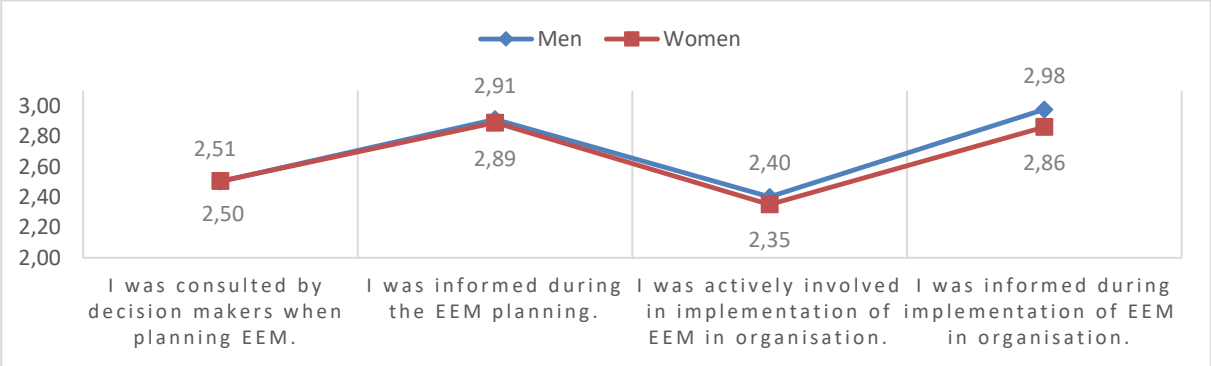
The replies of the respondents, separately for employees and users per their gender confirm the positive attitudes of employees for all indicators except for the first and the third, where there is a higher share of indifferent attitudes which confirms that while planning EEM the employees were less consulted by the decision-makers and that the priorities of female employees were less considered. Regarding the average grades of employees, men compared to women perceive more significantly their participation in planning and implementation of EEM for most of the features (except for the sixth feature). On the other side, at four indicators analysed for the users, the grades are much lower than for the employees for both, male and female population, leading to a conclusion that the users were less introduced with implemented specific EEM in all phases than the employees. The differences between replies of users for male and female population are less than for employees, but male population of users gave a bit better grades.

The overview of the average grades of gender equality in implementation of specific EEM is given in the Picture 2.3 for employees and in the Picture 2.4 for users.



Picture 2.3. Average grades for gender equality in implementation of specific EEM for employees

For male and female employees, the average grades of their participation in planning and implementation of EEM (consulting, being informed, active involvement) are in the zone of positive expectations (above indifferent attitude). The biggest difference in average grades between male and female population is present in the feature "I was actively involved in implementation of energy efficiency measures in this building" (difference is 0,44). For service users, the average grades of their participation in planning and implementation of EEM, for men and women, are very similar, but they are in the zone of negative perception (below indifferent attitude) for all features.



Picture 2.4. Average grades for gender equality in implementation of specific EEM for users

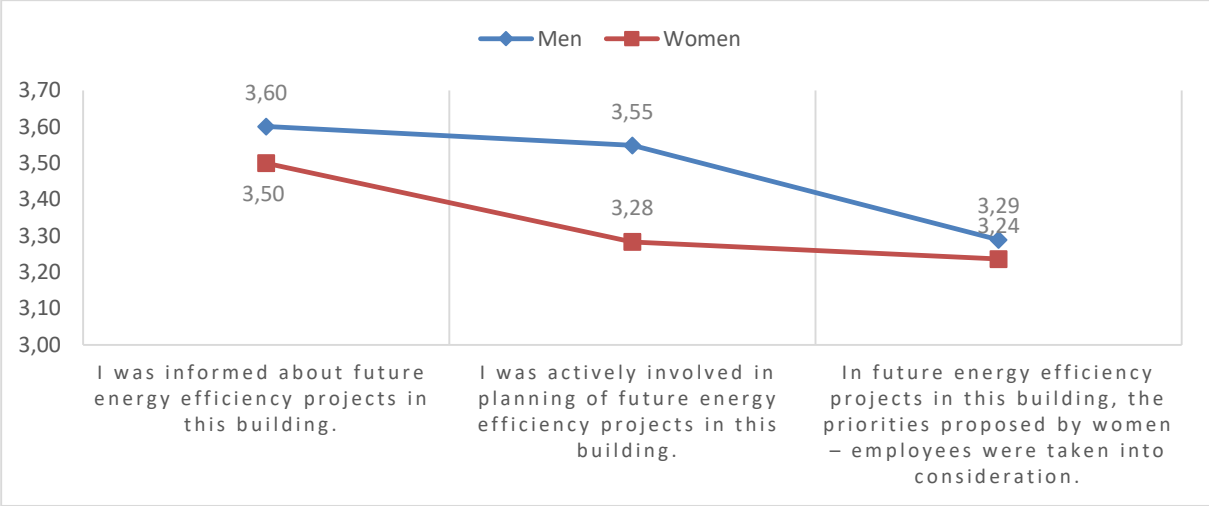
T–test of independent samples compared the assessment results of men and women on participation in planning and implementation of EEM. No statistically significant differences of the selected features were determined between men and women, for both employees and service users. Only for the feature "I was actively involved in implementation of energy efficiency measures in this building", statistically significant difference between men and women was found at employees. T-test confirmed that men and women, both employees and users, had almost equal access and participation in planning and implementation of specific EEM. However, the values of average grades of the assessed features related to transparency of implemented EEM indicate the need for bigger involvement of men and women, both employees and service users.

2.2.2. Analysis of gender equality in further activities on implementation of energy efficiency measures

Particularly analysed was gender equality from the aspect of further energy efficiency activities in specific building, in fact planning of further EEM. The indicators pertaining to information, active involvement and consideration of the priorities proposed by female employees were used in this specific assessment. For that purpose, three questions were defined, of which the third pertained to employees only.

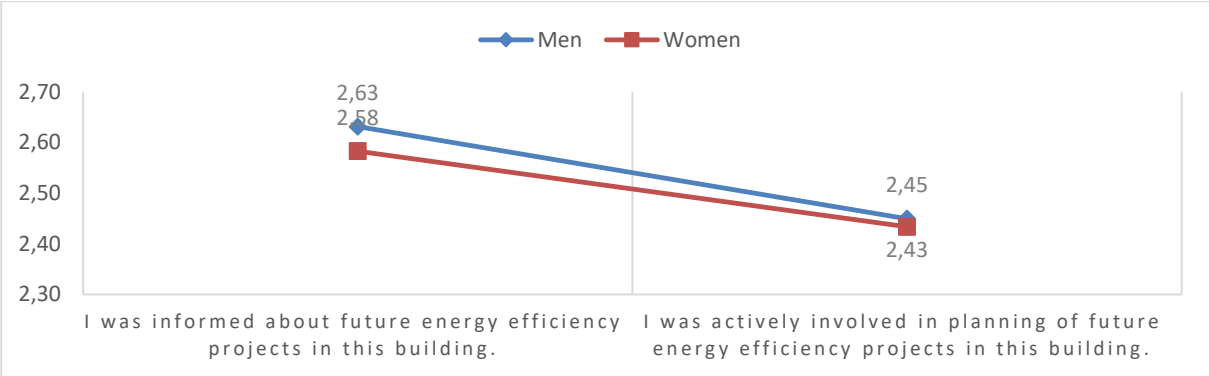
The same as in planning, implementation and exploitation of EEM, the employees were better informed than service users about further energy efficiency activities in certain institutions. Dominant share of positive attitudes of male employees in the first and the second indicator may be noticed. In all other cases, there were 20% more indifferent attitudes. In addition, higher percentage of negative attitudes of users for both indicators should also be noted.

Looking at the average grades of employees for certain indicators, presented in picture 2.5, it may be noticed that information level was evaluated the best (3,60 for male and 3,50 for female population), while the poorest grades were given to consideration of priorities proposed by female employees (3,29 for male and 3,24 for female population). For all indicators, the average grades of male population are higher, and the biggest difference is in attitudes of male and female population regarding the active involvement in planning of future energy efficiency projects.



Picture 2.5. Average grades for gender equality in further energy efficiency activities for employees

As already noted, the picture 2.6. shows that the average grades for two assessed indicators are lower for users than for employees, and the difference in the average grades between male and female population is smaller than for employees (male population has higher average grade for 0,05 in the first and 0,02 in the second indicator). The users gave better grades to information level than to active involvement in planning of future energy efficiency projects.



Picture 2.6. Average grades for gender equality in further energy efficiency activities for users

T-test of independent samples compared the assessment results of involvement of men and women in further activities related to implementation of EEM, for both employees and service users. Statistically significant difference was determined between man and women (P<0,05) for the feature "I was actively involved in planning future energy efficiency projects in this building", with the biggest difference between the average values. There is no significant difference at female and male employees regarding being informed about future projects and perception of consideration of the priorities in future EEM proposed by female employees. There are no statistically significant

difference at men and women for any feature. Considering that the average values for male and female service users are very low and below indifferent attitude, the need for bigger participation of both, women and men in planning future EEM is indicated.

2.3. Gender equality in achievement of equal benefits from specific energy efficiency measure for employees and service users

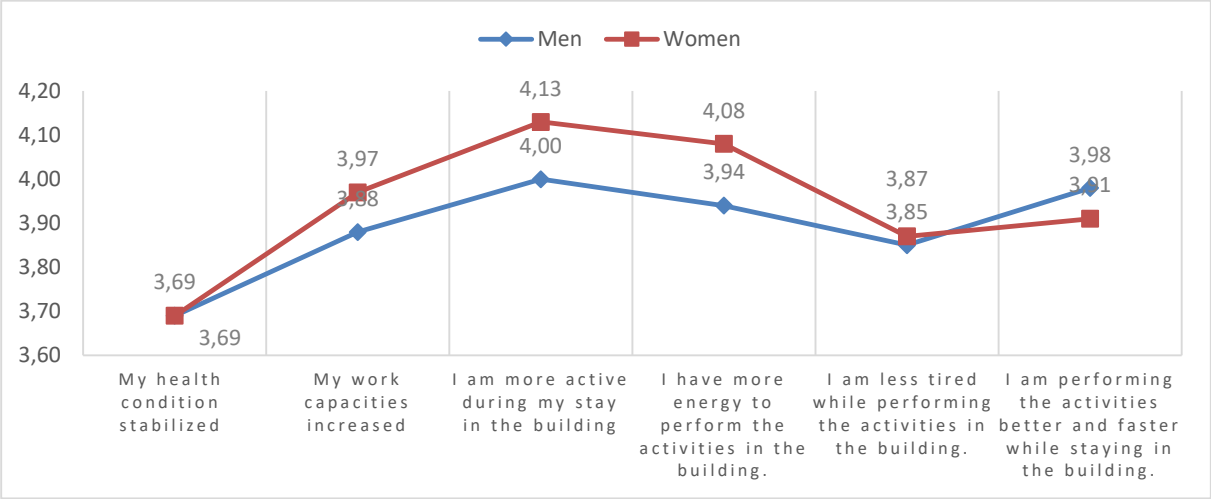
Gender equality regarding benefits of specific EEM was evaluated through the dimensions of impact to physical and mental health of employees and users, individual benefit and social cohesion of employees and individual benefit of service users.

2.3.1. Analysis of gender benefits from energy efficiency measures for physical health of respondents

Dimension of EEM impact to physical health includes the indicators related to: stabilization of health condition, increase of work capacities, increase of work activity, increase of work energy, decrease of fatigue and improvement and speeding-up the performance of work activities. The respondents were asked six questions.

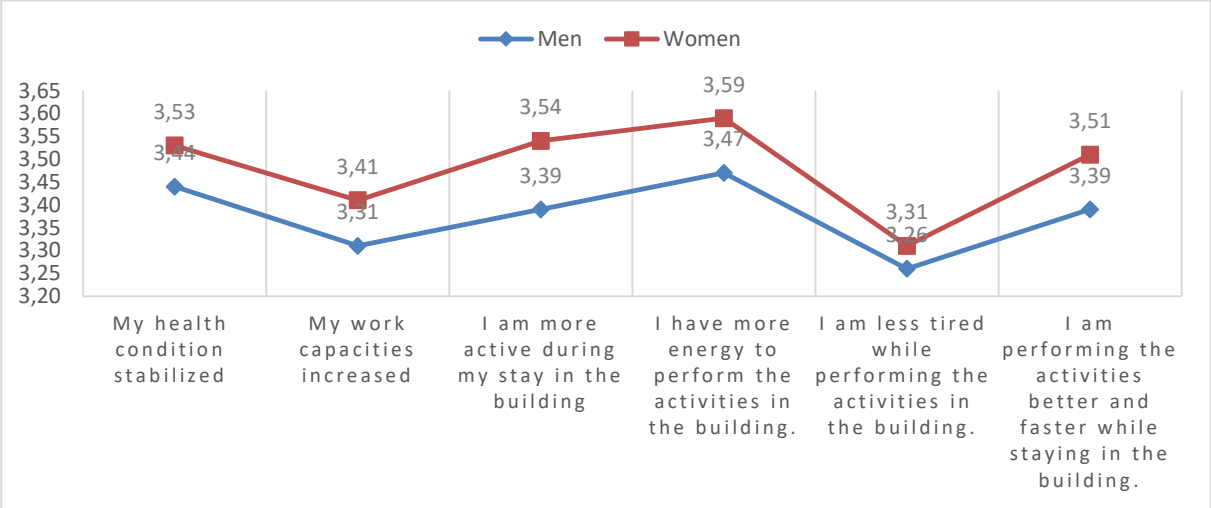
Distribution of respondents' replies separately for male and female population shows that percentage of positive grades for both genders of employees is over 70% for almost all indicators. Lower percentage of positive grades from employees is in the first indicator for female (58,90%) and male (60,67%) population and in the fifth indicator for female population (69,96%). Percentage of positive replies from the users is significantly lower and only in the fourth indicator for female population it exceeds 55% (57,16%). The lowest percentage of positive grades for male and female population of the users is in the fifth indicator (43,69% and 43,47%).

The picture 2.7. shows that the average grades of employees are higher only in the last indicator for male population, for the first indicator are the same, while for other four indicators the grades of female population are higher.



Picture 2.7. Average grades for gender equality in impact of EEM to physical health of employees

Similar relation between male and female population is seen at the users in the Picture 2.8, where the difference between different gender is present in all indicators and in all cases the average grades of female population are higher than the average grads of male population. The above mentioned leads to a conclusion that except for EEM impact to stabilization of health conditions and improvement and speeding-up the performance of work activities of employees, on question on physical health, female population of employees and users perceives better the implemented EEM than male population.



Picture 2.8. Average grades of gender equality in impact of EEM to physical health of user

T-test of independent samples compared the assessment results between men and women, both employees and service users. Compared to all features of physical health of employees, no statistically significant difference was determined between men and women. However, for service users, there are statistically significant differences between men and women ($p<0,05$) for the feature: „I am more active while staying in the building“ and „I perform my work duties better and faster while staying in the building“. Considering the average values of those features, it may be concluded that female service users perceive more significantly the impact of EEM to physical health than male users.

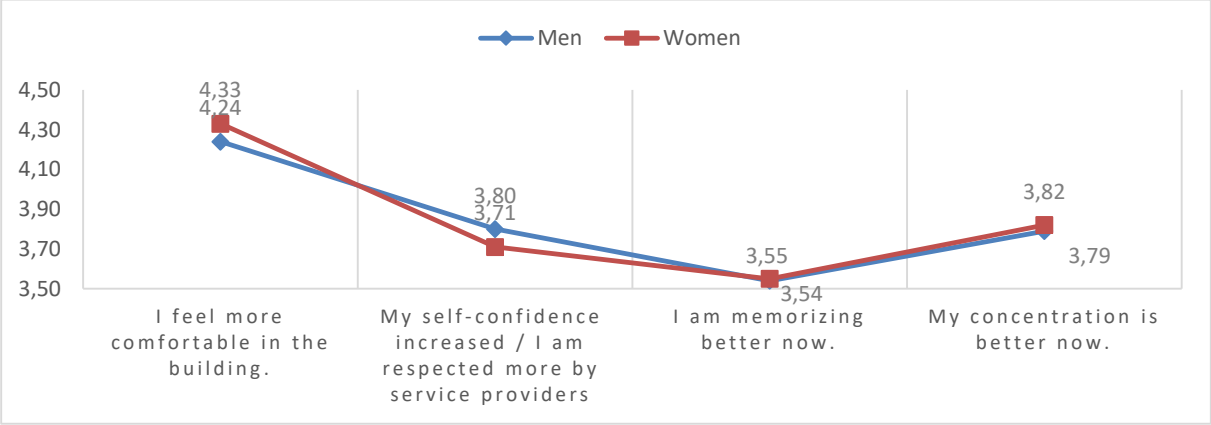
2.3.2. Analysis of gender equality benefits from energy efficiency measures for mental health of respondents

Gender equality dimension in impact of EEM to mental health includes the following indicators: increased comfort while staying in building, increased self-respect (for employees) / respect by service providers (for users) and improved memorizing and concentration.

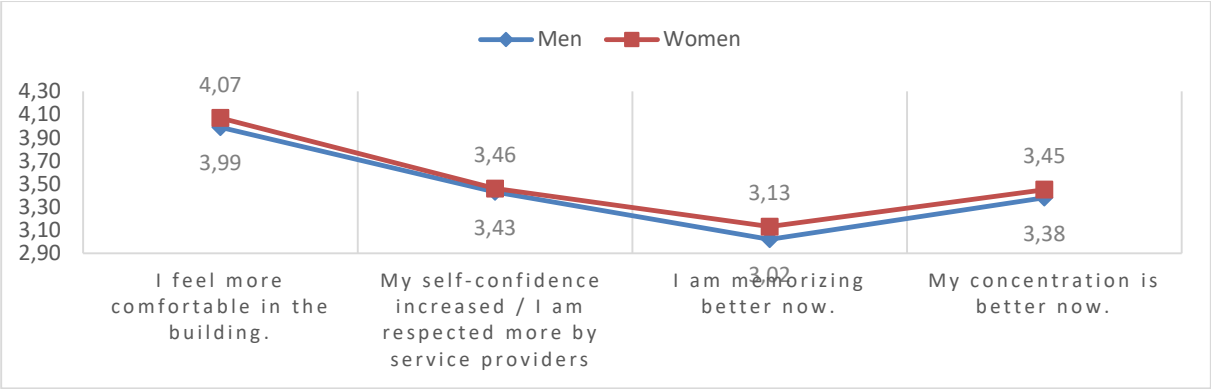
Regarding the impact of EEM to mental health, the percentage of indifferent attitudes is more emphasised and it exceeds 20% for all indicators, except of the first one, where positive grades exceed 70%. The percentage of positive attitudes on impact of EEM to memorizing is the lowest at male population of users (35,96%).

The pictures 2.9 and 2.10 show that the average grades of EEM impact to mental health are almost equal among male and female population of both, employees and service users. Similar to the impact

to physical health, the average grade for almost all indicators is bigger at female population. The exception is the second indicator for employees where the average grade is higher for male population.



Picture 2.9. Average grades for gender equality in impact of EEM to mental health of employees



Picture 2.10. Average grades for gender equality in impact of EEM to mental health of users

T-test of independent samples compared the results of perception on equal gender benefits from implemented EEM for mental health of both, employees and service users. It was determined that for both, employees and service users, there are no statistically significant differences in any features between men and women. It indicates the conclusion that both, men and women, employees and service users, perceive almost equally the benefits of EEM to mental health.

2.3.3. Analysis of equal gender individual benefits at work from energy efficiency measures for employees

Gender equality dimension for individual benefit from EEM for employees measured through the indicators pertaining to: increase of comfort at workplace, decrease of difficulties at work, increase of time of stay in the building, decrease of absence from work and motivation for higher income. Those questions applied only to employees.

The percentage of positive attitudes on individual benefit for the first, the second and the fifth indicator is emphasised. The picture 2.11 shows that in the first two indicators, the average grades of women are higher, while for the remaining indicators are higher for men.

Picture 2.11. Average grades of gender equality in individual benefits from EEM for employees

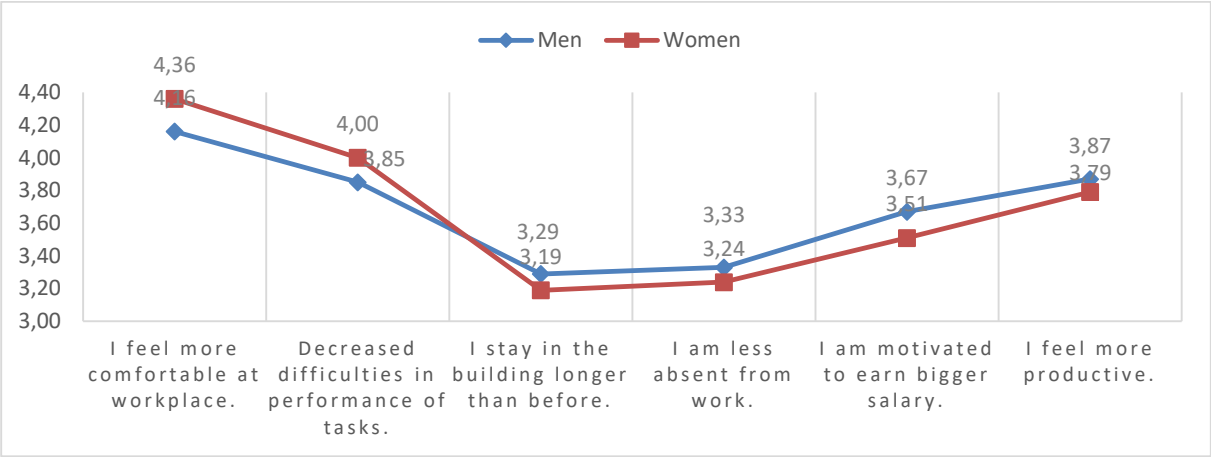
T-test of independent samples compared the assessment results between male and female employees against equal gender individual benefits at work. Statistically significant difference was found between men and women only in one feature: „I feel more comfortable at work“. Considering the average value of this feature, it may be concluded that female employees perceive more significantly the impact of EEM to comfort at work than male employees. T-test difference between male and female employees for other features of gender individual benefits from EEM did not show any statistically significant differences. It leads to a conclusion that male and female employees almost identically perceive the achievement of individual benefits from specific EEM at work.

2.3.4. Analysis of equal gender benefits from social cohesion at work as a consequence of energy efficiency measures

Gender equality dimension in impact of specific EEM to social cohesion of employees was measured through the indicators pertaining to: increase of cooperation with colleagues, higher motivation to participate in decision making, improvement of inter-personal relationships and decrease of conflicts among employees.

There is a higher percentage of positive attitudes of employees of both gender, particularly regarding the cooperation in work with colleagues. Significant percentage of indifferent attitudes (over 35%) is seen at female population for the second, the third and the fourth indicator, as well as at male population for the fourth indicator.

The picture 2.12 shows that in first two indicators the average grades were higher at female, and in the third and the fourth indicator at male population of employees.



Picture 2.12. Average grades for gender equality in impact of specific EEM to social cohesion of employees

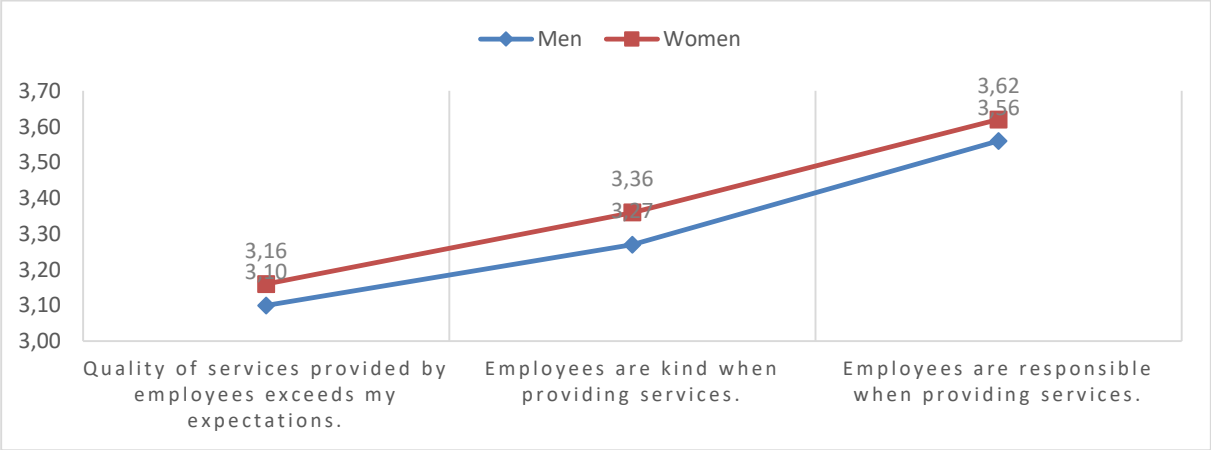
T-test results for achievement of gender benefits from social cohesion at work as a consequence of EEM, between male and female employees, based on the obtained p-values indicate that there are no statistically significant differences in perception of social cohesion between men and women. It means that men and women almost equally perceive the impact of EEM to the features of social cohesion of employees at work.

2.3.5. Analysis of gender individual benefits from performance of employees after implementation of energy efficiency measures for service users

Gender equality dimension in impact of individual benefits from performance of employees after implementation of EEM for service users was measured by the indicators pertaining to increase of service quality and increase of kindness and responsibility of employees.

The significant share of indifferent attitudes for almost all indicators (over 30%) is present. The exception is the indicator pertaining to increase of employees' responsibility for which the highest percentage of positive attitudes was at female population (57,85%).

As presented in the picture 2.13 the average grades for all three indicators are higher at female population of users.



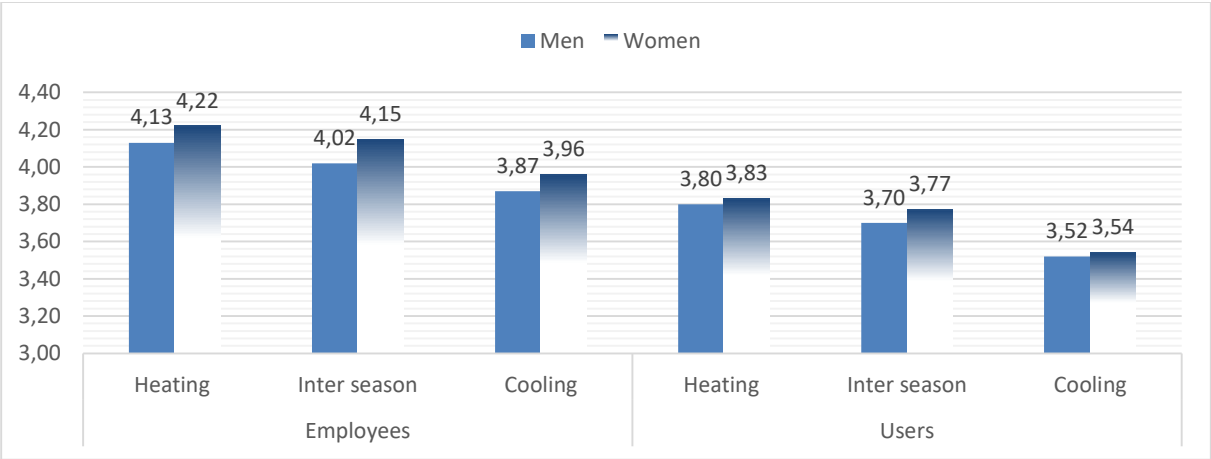
Picture 2.13. Average grades for gender equality in individual benefits from EEM for users

T-test of independent samples compared the assessment results between male and female service users on performance of employees after implementation of EEM. Based on the obtained p-values, it may be determined that there are no statistically significant differences in perception of the features between men and women. It means that both, male and female service users almost equally perceive the impact of EEM to performance and behaviour of employees and quality of service.

2.3.6. Analysis of gender differences in satisfaction with physical features of premises after implementation of energy efficiency measures

The last dimension considered within gender equality pertains to satisfaction with physical features of premises after implementation of specific EEM. This dimension includes the following indicators of satisfaction with the features of premises: average temperature, ventilation, lights, air quality and humidity, sound insulation, energy consumption and energy costs. For the last two indicators, only the employees were interviewed, while for the remaining indicators, both the employees and the service users were interviewed. The attitudes of male and female population were analysed separately for heating season (15.10.-15.04.), inter season (16.04.-14.06. and 16.09.-14.10.) and cooling season (15.06.-15.09.).

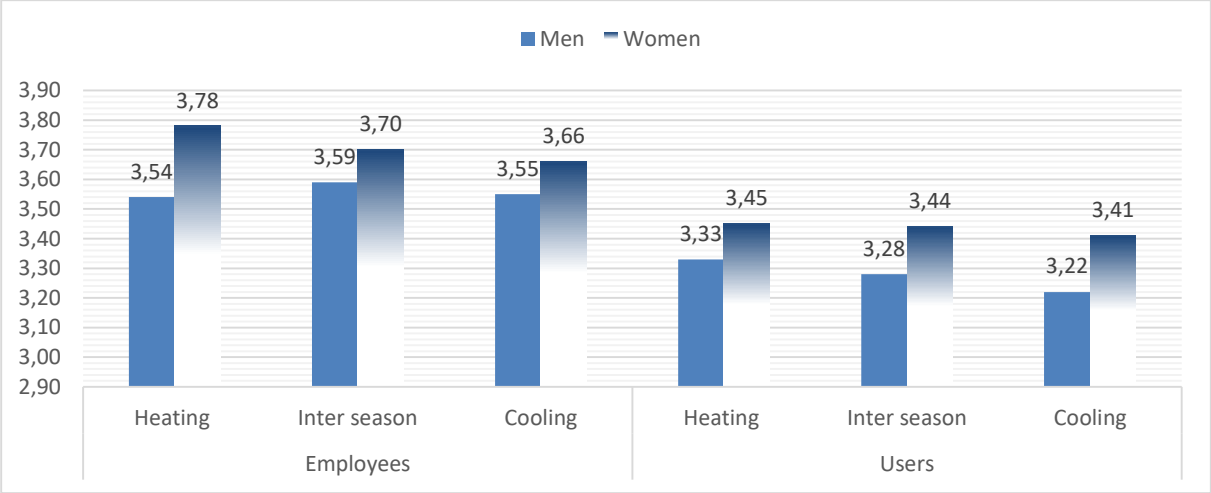
The perceived attitudes of respondents on the level of satisfaction with average air temperature in building are presented in the Picture 2.14 showing that the average grades of employees are much better. The level of satisfaction with average temperature for female population of both, employees and service users, is higher. The best grades were given for heating season, which indicates that respondents are more satisfied with the effects of implemented measures pertaining to the heating season than the measures pertaining to the cooling season. Higher satisfaction level of female population might be the consequence of bigger sensitivity of male population to low temperatures in the heating season or their higher expectations in terms of temperature. Differences in attitudes of male and female population are more expressed among employees than service users.



Picture 2.14. Average grades for satisfaction with air temperature in building

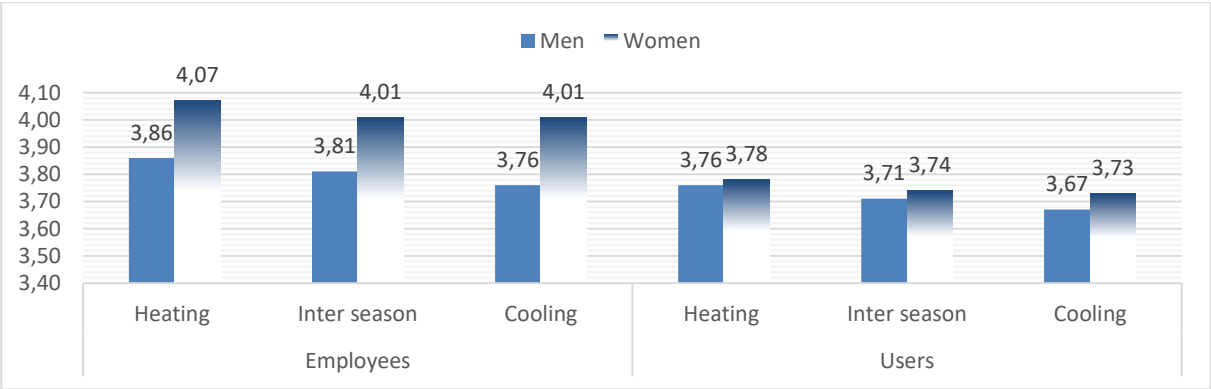
Regarding satisfaction with ventilation in the building, differences between male and female population are very expressed in all seasons for both, employees and service users, as shown in the

Picture 2.15. The average grades of employees are higher than the grades of users, while female population in all cases had higher average grades than male population. Differences in average grades between male and female population are much higher than the grades of average temperature, which may be the consequence of bigger differences in expectations of male and female population regarding ventilation against temperature. The biggest difference in average grades between male and female population is noticed among employees in the heating season (0,24).



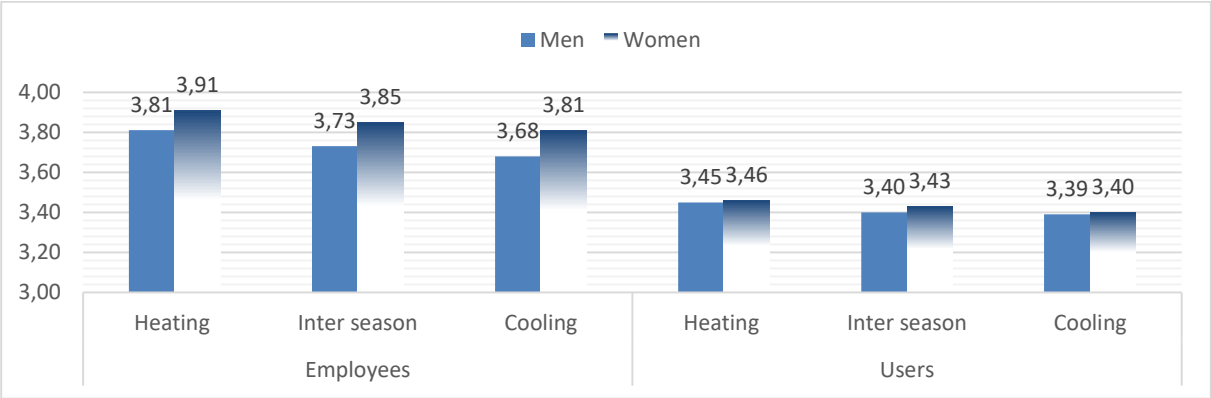
Picture 2.15. Average grades for satisfaction with ventilation in building

As shown in the picture 2.16, the differences between the average grades of satisfaction with lights in the building between male and female population are much bigger for employees than for users. The fact that employees spend more time in the building than users might be the reason to their better grades, but the question is why female population gave much better grades. The biggest difference between male and female population occurs at employees in the cooling season. (0,25).



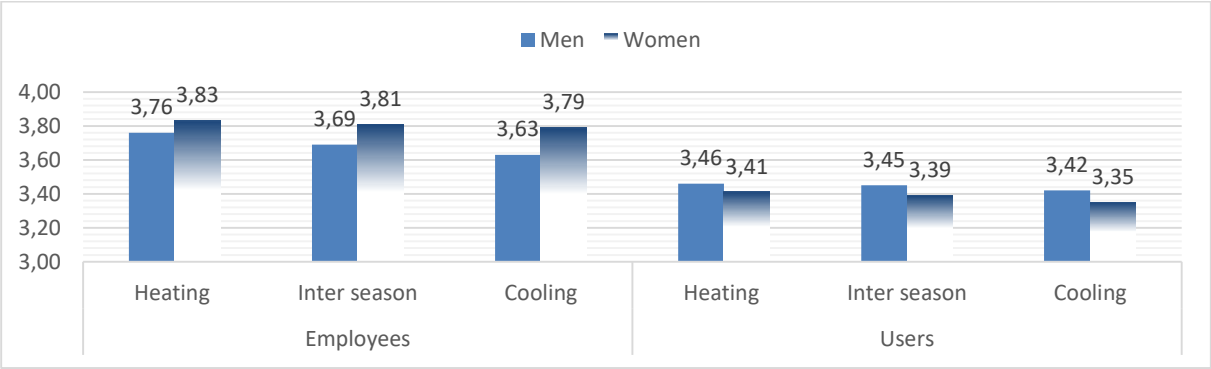
Picture 2.16. Average grades for satisfaction with lights in building

Similar results have been obtained in the average grades of satisfaction with air quality in the building, which is shown in the Picture 2.17. Female population gave again better grades than male population, and the differences are expressed more among the employees than the users. For users, the grades of female population are almost equal to male population.



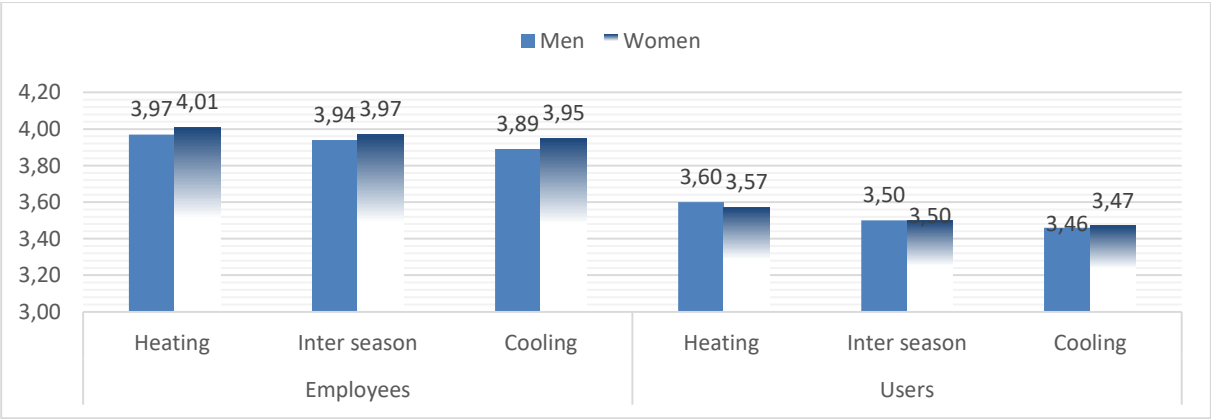
Picture 2.17. Average grades for satisfaction with air quality in building

Level of satisfaction with air humidity in the building is characteristic because in this indicator, the average grades of users are higher at male than at female population. On the other side, the Picture 2.18 shows that for employees the average grades of female population are higher than the average grades of male population. Significant difference in grades depending on the season may not be noticed, but the grades of employees are much higher than the grades of users.



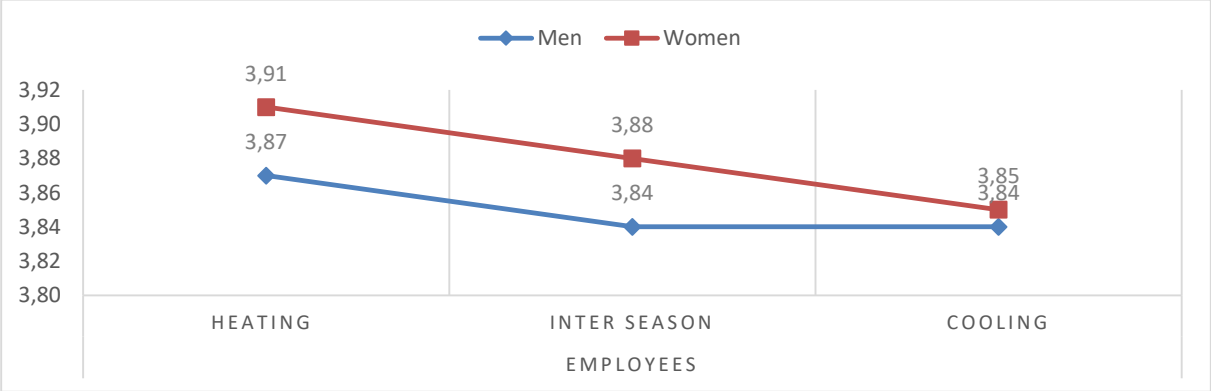
Picture 2.18. Average grades for satisfaction with air humidity in building

The biggest balance in grades of male and female population is seen in evaluation of satisfaction with sound insulation in the building. The Picture 2.19 shows that differences between male and female population are negligible in all cases, and the average grade of male population is higher than of female population in the heating season. As in the previous cases, the employees gave better grades than the users.



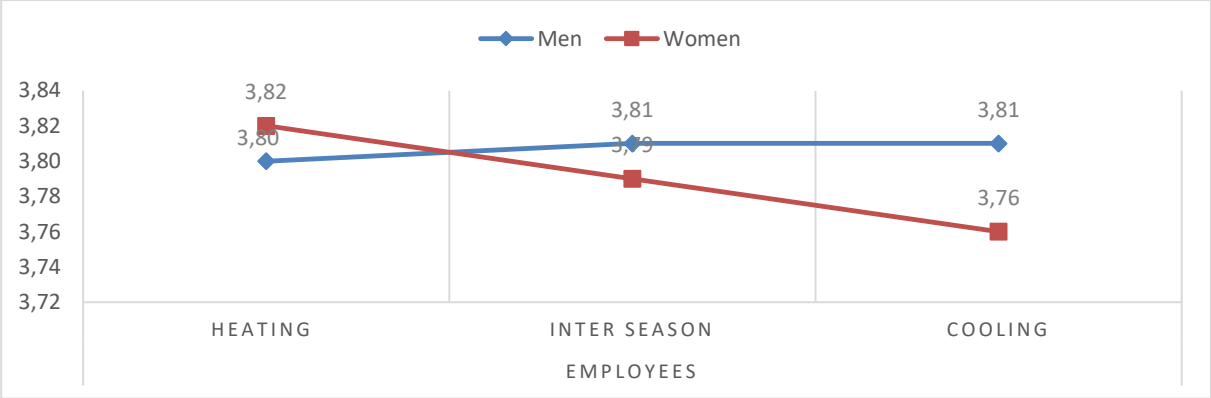
Picture 2.19. Average grades for satisfaction with sound insulation in building

Grades for satisfaction with energy consumption in the building and energy costs were given by employees only. The Picture 2.20 shows that women were more satisfied with energy consumption in all three seasons, and the best grades were given for the heating season.



Picture 2.20. Average grades for satisfaction with energy consumption in the building

Different from the satisfaction with energy consumption, male population gave bigger grades for energy costs in inter season and cooling season, while the average grade given by women was bigger for heating season. The Picture 2.21 shows that the biggest difference between male and female population was in the cooling season.



Picture 2.21. Average grades for satisfaction with energy costs in the building

T-test of independent samples determined that between men and women in certain seasons (heating season, inter season and cooling season) there are statistically significant differences in satisfaction with physical features of premises where some EEM was implemented in terms of ventilation and lights in the building.

Regarding differences in satisfaction with ventilation in the building after implementation of EEM, between men and women, statistically significant difference was found for employees in the heating season, while for service users in all three seasons. For employees, the difference between men and women in the heating season has a small impact, while for user this difference has a small impact to explanation of variance in satisfaction with ventilation in all three seasons (eta square much below 0,01).

Regarding satisfaction with lights in the building after implementation of EEM, between men and women, the T-test determined statistically significant difference for employees in all three seasons. The impact of difference to explanation of variance of the assessed features between men and women in all three seasons is somewhat bigger than small (eta square a bit over 0,01). For service users, statistically significant difference was not found in any season regarding satisfaction with lights between men and women.

T-test of independent samples determined that between men and women, both employees and service users, in all three seasons (heating season, inter season and cooling season) there are no statistically significant differences in terms of satisfaction with the following features of premises where some of EEM was implemented:

- average air temperature,
- air quality,
- air humidity and
- sound insulation in building.

At the same time, between male and female employees, T-test of independent samples did not find any statistically significant differences regarding satisfaction with energy consumption and energy costs in the building.

3. IMPLICATIONS OF THE MAIN STUDY RESULTS AND RECOMMENDATIONS

Based on the previous analysis, it may be generally concluded that implemented EEM in public buildings had positive effects to human development and gender equality of employees and service users. However, certain problems have been found in transparency of the EEM implementation process and gender discrimination gap has been identified in EEM pertaining to education, labour market and empowerment of women.

The most important implications of this study pertain to the fact that EEM help the citizens improve their health, improve their knowledge of energy efficiency and adjust their behaviour accordingly, improve their living standard and gender equality. From the aspect of human rights, EEM programme in public buildings was implemented mainly in accordance with the principles of equal rights, equal opportunities in achievement of rights and equal benefits for employees and service users.

3.1. Key recommendations related to human development

As some institutions did not participate in the study and there are many of those that took part but did not submit the requested information (about investments, costs, savings, etc.), it was necessary to oblige them during the phase of access to EEM programme to participate actively. That way, the conditions were created for obtaining more precise and more useful findings of the study, which could improve the overall EEM programme.

Regarding the typology of public buildings, the financial effects in terms of necessary investments and costs saving could be calculated for typical buildings (heating, electricity, maintenance, repairs, etc.) for each individual EEM, in order to evaluate the investment return period as precisely as possible. This would be important information for decision makers in their decision making on EEM.

Annual costs saving in public institutions, as well as effects of implemented EEM, could be directed to implementation of the future EEM. This activity could be integrated into the contracts in the phase of approach to EEM programme.

Positive effects pertaining to improvement of heating quality and inside temperature in different seasons in public buildings, as well as decrease of staff absences from work and insignificant impact to loss of employment, could be used in promotional activities related to EEM.

Positive perception of respondents about the impact of EEM to human health and comfort in the building may also be used in promotion of EEM.

There is a significantly high level of correlation and agreement in rank sequence of different EEM between employees and service users, which should be considered when planning future EEM implementation and energy efficiency trainings for citizens. The effects of energy efficiency knowledge impact to behaviour of respondents clearly indicate the need to improve the knowledge in this segment. These could be the guidelines for promotion and training in this segment.

As the respondents perceive positive effects of measures to different dimensions of living standard, such as: energy costs reduction, positive impact to economic growth and development, potential for increase of population income and increase of living standard, those findings could be used in promotion purposes. The findings on perception of potential difficulties at work due to EEM, positive perception of EEM impact to environment protection, improvement of social cohesion and performance of employees could also be used in similar purposes. The implications of those findings could also refer to planning of different EEM subsidy programmes in both, public and private sector.

Findings on satisfaction of respondents with physical features of premises after implemented EEM indicate that when designing EEM implementation, one must take much more care of the air features of the building: ventilation, quality and humidity, as the respondents demonstrated the poorest satisfaction with those features in all three seasons.

The indication that low-income employees comply less with energy efficiency than the higher-income employees, indicates the need for additional energy efficiency training for low-income employees.
In order for EEM to reduce the poverty, it is necessary to intensify interventions in:

- Public educational campaigns about energy efficiency in order to develop knowledge, capabilities and readiness of people to behave in compliance with energy saving and energy efficiency principles, in both public and private sector. This campaign could have a special target group pertaining to poorer categories of population.
- Development of institution and more efficient mechanisms for energy audit and EEM design, particularly for residential buildings. It is necessary to develop energy audit and EEM design programmes for poorer population groups.
- With pilot projects related to EEM in residential buildings, particularly for poor population categories, with adequate promotional campaign, confirm the actual effects of implementation of such measures.
- Develop overall and self-sustainable EEM funding system, particularly for residential buildings for poorer population categories.

The key findings of transparency of specific EEM implementation and planning of future EEM indicate that in order to improve it, the following activities should be implemented:

- Initiate transparently the initiative that from BiH level, in coordination with entities and Brčko District BiH, all public institutions in BiH get involved into the EEM programme. It means that energy audit is implemented and the projects for different EEM is made for each public institution. Involve in the project development activities management, employees and service users. Public institutions must provide legally regulated implementation of planned EEM, in order to avoid the problems in implementation.
- Ensure equal access to energy efficiency programmes for all public institutions, in accordance with the defined terms and conditions. It refers to public call or tender for different activities related to energy efficiency.
- Pursuant to clearly defined criteria, select transparently the public institutions with specific EEM.
- Ensure transparency and more adequate supervision and control of implementation of planned works from EEM projects.

- Regarding the improvement of responsibility mechanism in all phases of energy efficiency project implementation, it is necessary to conduct more adequate preparations with management, employees and service users of public institutions.
- The findings indicate the need to improve the participation of employees according to their post in organisation in planning and implementation of EEM. At service users, the results indicate that it is necessary to improve their participation in planning of future EEM, taking into consideration more adequate involvement of the users from different groups according to their educational degree, buildings where they lived and type of the settlement of their residence.

3.2. Key recommendations related to gender equality

The findings indicate that energy efficiency training may be accessed equally by male and female employees. However, when it comes to service users, significant differences have been determined between men and women in the segment of energy efficiency training, where the men perceive gender equality with lower intensity in this segment. Aimed at prevention of discrimination against women, it is necessary to additionally develop the awareness of male service users about equal opportunities for women to participate in energy efficiency trainings. This may be ensured with recommendations that the relevant stakeholders in energy efficiency trainings obligatory provide equal participation of women.

The same conclusions apply to the gender equality of professional engagement in energy efficiency sector. There are no determined differences between male and female employees regarding the access to the labour market in energy efficiency sector. However, when it comes to service users, significant differences have been determined between men and women regarding gender equality in professional engagement, where men perceive with lower intensity the gender equality in this segment. To prevent discrimination against women, it is necessary to additionally raise the awareness of male service users on equal opportunities for professional participation of women in decision making related to energy efficiency. This may be ensured with recommendations that the relevant decision makers obligatory provide equal participation of women in professional engagement in the energy efficiency sector.

However, when it comes to the features related to empowerment of women in energy efficiency sector, men and women, both employees and service users, are very different, where male respondents perceive with lower intensity the role of women in this sector. Therefore, it is necessary to additionally raise the awareness of men about the need for empowerment of women and their role in energy efficiency sector, in order to annul the determined discrimination gap. With energy efficiency projects, higher sensibility and bigger involvement of women positively affect the gender equality and therefore it is necessary to additionally use the energy efficiency projects for change of beliefs, perceptions and stereotypes related to gender equality.

Although there are no differences in responses between male and female employees, the perception of the feature that in EEM planning the priorities proposed by women – employees is almost near the indifferent attitude. Despite the reasons to this, certain EEM should also be considered in the context of specific needs of women, either employees or service users.

As male and female employees perceive almost equally the achievement of individual benefits at work from specific EEM, except for the feature comfort at work, it is necessary to determine why women – employees have statistically much higher average grade for this feature.

Availability of statistically significant differences in satisfaction with physical features of premises where specific EEM was implemented between men and women imposes the need, particularly regarding ventilation and lights, to provide for different expectations of women and men.

Other findings indicating the gender equality, including: being informed and involvement in planning and implementation of EEM, planning further EEM, health, social cohesion, behaviour of employees, satisfaction with temperature, air quality and humidity, sound insulation and other may be used in promotion of EEM effects.

STUDY ON HUMAN DEVELOPMENT BENEFITS AND GENDER MAINSTREAMING THROUGH IMPLEMENTATION OF INFRASTRUCTURE ENERGY EFFICIENCY MEASURES IN PUBLIC BUILDINGS

- APPENDICES -

May 2018.

Centre for Development and Support (CRP) Tuzla

APPENDIX 0.

Appendix 01. Variables and indicators of energy efficiency measures' impact to human development

Dimension	Indicators
Property value of the project of MEE implementation in public buildings	
Location of building	Distribution of types of buildings per entities and regions.
Conducted works	Distribution of conducted works per types of buildings.
Investment value	Value of investments per types of buildings.
Financial effects of implemented MEE	
Savings	Decrease of heating, electricity, maintenance and repair costs.
Economic justification	Period of return of investment into MEE.
Quality of heating	
Change of temperature	Change of temperature in heating season, inter seasons and cooling season.
Quality of heating	Questionnaire attitudes of management on quality of heating before and after implementation of MEE.
Effects of MEE to staff recruitment	
Absence from work	Change of average annual number of days of employee absence from work before and after implementation of MEE.
Staff recruitment	Number of employees reallocated to another post and number of employees who lost the job due to implementation of MEE.

Table P-01. Variables and indicators of direct MEE effects

Dimension	Indicators
Impact of MEE to human health	
General human health	Questionnaire attitudes on impact of MEE to general human health.
Physical health	Questionnaire attitudes on impact of MEE to physical health of employees and service users.
Mental health	Questionnaire attitudes on impact of MEE to mental health of employees and service users.
Impact of MEE to knowledge and behaviour of people	
Priorities of different MEE	Ranking per significance of impact of the different MEEs to energy saving by employees and service users.
Perception of return period for investment into MEE	Perception of return of investment into MEE by employees and service users.
Behaviour of employees in daily life	Perception of impact of knowledge on MEE to behaviour of employees and service users related to energy consumption in daily life.
Impact of MEE to living standard of people	

General expectations	Perception of MEE impact to living standard of employees and service users.
Potential difficulties	Perception of employees and services users on potential difficulties affected by MEE.
Environment protection	Perception of impact of MEE to environment protection by employees and service users.
Social cohesion	Perception of social cohesion of employees at workplace.
Terms of work	Perception of employees regarding staff performance affected by MEE.
Satisfaction with physical features of premises	Perception of employees and service users regarding satisfaction with physical features of premises after introducing MEE.
Poverty reduction	Perception of differences between the poor and other employees and service users on impact of knowledge about MEE to daily behaviour and relation of MEE and potential difficulties at work.
Behaviour of employees after implemented MEE	Perception of service users on behaviour of employees after implementation of MEE.
Improved service quality	Perception of service quality after implementation of MEE measures by employees and service users, per types of buildings.

Table P-02. Variable and indicators of indirect MEE effects

Dimension	Indicators
Transparency of programme and responsibility mechanisms	
Transparency of implementation	Stakeholders in initiating, planning, proposing, approving and terms of inclusion of specific MEE; clarity of selection criteria; problems in implementation; conflicts and appeals.
Responsibility mechanisms	Questionnaire attitudes on understanding the responsibility mechanism of stakeholders in the process of planning and implementation of MEE by management.
Participation of employees and users	Questionnaire attitudes on inclusion of employees and service users into planning and implementation of specific MEE and continued activities on MEE in specific building

Table P-03. Variable and indicators of transparency and responsibility mechanism

Appendix 02. Variables and indicators of energy efficiency measures' impact to gender equality

Dimension	Indicators
Gender discrimination gap in the segment of MEE	
Education	Questionnaire attitudes on gender equality in education about energy efficiency.
Labour market	Questionnaire attitudes on gender equality in professional recruitment in the segment of energy efficiency.
Empowerment of women – prevention of discrimination	Questionnaire attitudes on role of woman in different activities in the segment of energy efficiency.

Gender equality in implementation of specific MEE	
Planning the specific MEE	Questionnaire attitudes on gender equality in planning the specific MEE.
Implementation of specific MEE	Questionnaire attitudes on gender equality in in implementation of specific MEE.
Exploitation of specific MEE	Questionnaire attitudes on gender equality benefits of certain MEE.
Planning the future MEE	Questionnaire attitudes on gender equality in planning of future MEE.
Gender equality in achievement of equal benefits from specific MEE	
Health	Questionnaire attitudes on gender equality and impact of specific MEE to physical and mental health of employees and service users.
Individual benefits for employees	Gender equality in impact of specific MEE to individual benefits of employees.
Social cohesion	Gender equality in impact of specific MEE to social cohesion of employees.
Individual benefits for service users	Gender equality of service users compared to the impact of specific MEE to the benefits of the provided service.
Satisfaction with physical features of premises	Gender equality in impact of specific MEE to employee and service users' satisfaction with premises.

Table P-04. Dimensions and indicators of gender equality affected by MEE

Appendix 03. Features of population and sample

No	Type of public institution	EMPLOYEES					USERS				
		Population		Sample		Sample /population	Population		Sample		Sample /population
		f	%	f	%		f	%	f	%	
1	Hospitals	752	14,86	32	7,29	4,26	2.560	7,04	43	2,87	1,68
2	Health centres	416	8,22	25	5,69	6,01	1.508	4,15	62	4,14	4,11
3	Culture institution	40	0,79	5	1,14	12,50	300	0,83	8	0,53	2,67
4	Sport institution	8	0,16	5	1,14	62,50	100	0,28	5	0,33	5,00
5	Public administration	515	10,18	26	5,92	5,05	1.478	4,07	33	2,21	2,23
6	School for children with special needs	40	0,79	5	1,14	12,50	154	0,42	10	0,67	6,49

7	Schools	2.695	53,26	251	57,18	9,31	26.503	72,93	1.191	79,61	4,49
8	Faculty	276	5,45	17	3,87	6,16	1.850	5,09	70	4,68	3,78
9	All-day care & nursing centres	124	2,45	15	3,42	12,10	410	1,13	11	0,74	2,68
10	Kindergartens	194	3,83	58	13,21	29,90	1.476	4,06	63	4,21	4,27
	TOTAL	**5.060**	**100**	**439**	**100**	**8,68**	**36.339**	**100**	**1.496**	**100**	**4,12**

Table P-05. Structure of sample compared to population and type of public building

Variable	Modalities	Employees		Users	
		f	%	f	%
Gender	M	178	40,83	702	47,05
	F	258	59,17	790	52,95
Education degree	Primary school degree	20	4,60	518	61,89
	High school degree	136	31,26	175	20,91
	Associate degree	58	13,33	44	5,26
	University degree	202	46,44	93	11,11
	M.Sc	16	3,68	6	0,72
	D.Sc	3	0,69	1	0,12
Age	To 20	1	0,23	1.177	80,07
	21-30	23	5,35	106	7,21
	31-40	119	27,67	92	6,26
	41-50	128	29,77	52	3,54
	51-60	140	32,56	32	2,18
	61 and more	19	4,42	18	0,75
Number of household members	1	19	4,55	6	0,43
	2	62	14,83	52	3,71
	3	102	24,40	203	14,50
	4	149	35,65	587	41,93
	5	57	13,64	336	24,00
	6 and more	29	6,94	216	15,43
Average monthly income (KM)	To 1.000	124	29,81	312	27,13
	1.001-1.500	113	27,16	290	25,22
	1.501-2.000	97	23,32	242	21,04
	2.001-2.500	50	12,02	124	10,78
	Over 2.500	32	7,69	182	15,82

Table P-06. Socio-demographic features of respondents

Appendix 04. Internal consistency of developed measuring instruments

Dimension	Cronbach alpha
Impact of MEE to general human health	0,690
Impact of MEE to physical health of employees	0,896
Impact of MEE to mental health of employees	0,822
Impact of EE knowledge to behaviour of employees in daily life	0,796
General expectations from impact of MEE to living standard of people	0,853
Perception of employees on potential difficulties affected by MEE	0,720
Impact of MEE to environment protection	0,804
Impact of MEE to social cohesion of employees at work	0,815
Impact of MEE to performance of employees	0,799
Satisfaction with physical features of premises in heating season	0,889
Satisfaction with physical features of premises in inter season	0,898
Satisfaction with physical features of premises in cooling season	0,909
General attitudes on MEE impact to gender equality	0,812
Participation of employees in planning and implementation of specific MEE project	0,885
Participation of employees in planning further MEE activities	0,852

Table P-07. Cronbach alpha values subscale for employees

Dimension	Cronbach alpha
Impact of MEE to general human health	0,661
Impact of MEE to physical health of employees	0,828
Impact of MEE mental health of employees	0,735
Impact of MEE knowledge to behaviour of employees in daily life	0,760
General expectations from impact of MEE to living standard of people	0,791
Perception of employees on potential difficulties affected by MEE	0,704
Impact of MEE to environment protection	0,690
Perception of service users on behaviour of employees after implementation of MEE	0,826
Satisfaction with physical features of premises in heating season	0,864
Satisfaction with physical features of premises in inter season	0,854
Satisfaction with physical features of premises in cooling season	0,856
General attitudes of MEE impact to gender equality	0,767
Participation of employees in planning and implementation of specific MEE project	0,802
Participation of employees in planning further MEE activities	0,787

Table P-08. Cronbach alpha values subscale for service users

APPENDIX 1.

Appendix 1.1. Relative frequencies and average values of features from chapter 1.2.1.

Feature	Sample	Grade (%)					AV
		1	2	3	4	5	
Introduction of EE measure positively affects human health on a long-term basis.	E	3,87	1,59	9,57	41,91	43,05	4,19
	U	2,14	2,94	22,39	45,59	26,94	3,92
Introduction of EE measure positively affects age of people.	E	2,28	4,10	19,36	42,60	31,66	3,97
	U	3,08	9,23	33,04	36,99	17,66	3,57

Table P-1.1. Relative frequencies and average values of MEE impact to general human health

Feature	Sample	Grade (%)					AV
		1	2	3	4	5	
Stabilization of health condition	E	2,07	5,30	32,95	40,78	18,89	3,69
	U	5,90	8,92	35,55	29,98	19,65	3,49
Increase of work capacities	E	2,55	4,64	18,33	45,71	28,77	3,94
	U	7,91	10,46	33,74	33,13	14,76	3,36
More active work while staying in the building	E	2,07	1,84	16,59	45,16	34,33	4,08
	U	6,91	12,74	25,62	35,88	18,85	3,47
Investing more energy into performance of the activities is encouraged	E	2,07	1,61	17,97	48,39	29,95	4,03
	U	5,30	11,81	26,91	36,04	19,93	3,53
Lower tiredness while performing activities	E	2,31	2,31	25,17	47,58	22,63	3,86
	U	7,51	12,68	36,28	30,65	12,88	3,29
More productive work	E	2,31	3,23	17,55	52,19	24,71	3,94
	U	5,03	10,87	33,49	35,10	15,50	3,45

Table P-1.2. Relative frequencies and average values of MEE impact to physical health of respondents

Feature	Sample	Grade (%)					AV
		1	2	3	4	5	
Feeling more comfortable in the building	E	3,00	1,39	8,78	36,95	49,88	4,29
	U	4,69	4,69	14,08	35,61	40,91	4,03
Better memorizing	E	4,15	5,30	27,19	37,79	25,58	3,56
	U	7,18	10,19	31,92	32,06	18,65	3,08
Better concentration	E	3,69	8,53	34,10	35,94	17,74	3,81
	U	11,80	15,76	35,68	26,29	10,46	3,41
I have higher level of self-confidence	E	2,07	6,45	24,42	42,63	24,42	3,75
I am respected more by service providers	U	8,26	10,54	30,81	32,28	18,12	3,45

Table P-1.3. Relative frequencies and average values of MEE impact to mental health of respondent

Appendix 1.2. Ranking MEE by employees and service users and relative frequencies and average values of features in chapter 1.2.2.

Energy efficiency measure	Rank						
	1	2	3	4	5	6	7
Warming up of the building	236	111	36	14	7	9	10
Better quality joinery	77	202	84	20	18	11	11
Use of energy efficient appliances	9	36	119	133	72	32	22
Solar collector and photovoltaic cells	21	16	44	73	85	93	91
Use of energy saving light bulbs	6	8	38	66	98	97	110
Thermostats with programmable work regime	8	13	23	61	89	123	106
Hydro insulation measures	68	41	78	57	51	55	73

Table P-1.4. Frequency of ranks of MEE impact to energy saving by employees

Energy efficiency measure	Rank						
	1	2	3	4	5	6	7
Warming up of the building	742	384	160	62	40	43	34
Better quality joinery	230	502	438	118	72	49	56
Use of energy efficient appliances	52	134	285	424	302	117	91
Solar collector and photovoltaic cells	48	56	105	263	298	340	355
Use of energy saving light bulbs	29	62	150	248	354	290	332
Thermostats with programmable work regime	30	65	73	208	287	422	380
Hydro insulation measures	339	262	258	148	114	130	214

Table P-1.5. Frequency of ranks of MEE impact to energy saving by service users

Feature	Sample	Grade (%)					AV
		1	2	3	4	5	
Daily care for energy consumption	Sample	2,05	2,05	9,57	37,36	48,97	4,29
	K	6,68	7,29	24,60	32,35	29,08	3,70
More frequent monitoring of daily electricity tariffs	E	2,96	7,06	22,32	42,60	25,06	3,80
	U	17,26	19,67	33,18	19,06	10,84	2,87
More frequent turning off of lightbulbs and other devices when the respondent is not in the premise or when s/he does not use them	E	2,96	5,69	9,57	42,82	38,95	4,09
	U	9,96	9,96	19,92	30,75	29,41	3,60
Encouraging the purchase of energy efficient appliances	E	3,64	4,56	11,39	50,34	30,07	3,99
	U	11,04	15,52	34,65	26,02	12,78	3,14
Installation of efficient insulation if the funds were available	E	1,14	1,14	5,47	32,35	59,91	4,49
	U	5,08	4,41	21,99	34,22	34,29	3,88

Table P-1.6. Relative frequencies and average values of impact of energy efficiency knowledge to daily behaviour of respondents

Appendix 1.3. Relative frequencies and average values of features in chapter 1.2.3.1.

Feature	Sample	Grade (%)					AV
		1	2	3	4	5	
Energy efficiency projects positively affect economic growth and development.	E	1,83	0,68	7,99	44,06	45,43	4,31
	U	3,01	4,68	22,94	40,40	28,96	3,88
Energy efficiency projects are the potential for increase of population income.	E	2,05	0,91	11,62	43,05	42,37	4,23
	U	3,68	6,09	26,69	38,66	24,88	3,75
Energy efficiency projects reduce the energy costs in households and organisations.	E	1,82	0,91	4,78	37,36	55,13	4,43
	U	2,34	3,88	20,19	42,98	30,61	3,96
Energy efficiency projects increase the living standard.	E	2,73	1,59	13,90	38,18	42,60	4,17
	U	4,75	5,02	26,96	39,46	23,81	3,73

Table P-1.7. Relative frequencies and average values of general expectations from MEE impact to living standard of people

Appendix 1.4. Relative frequencies and average values of features in chapter 1.2.3.2.

Feature	Sampl	Grade (%)					AV
	e	1	2	3	4	5	
I expect that the number of people who lost the job shall increase in the buildings after implementation of EE measures.	E	30,77	27,27	26,34	11,42	4,20	2,31
	U	28,74	21,20	29,82	12,57	7,68	2,49
I expect that employees will have more difficulties in their work in the buildings applying EE measures.	E	37,67	31,63	15,12	9,07	6,51	2,15
	U	31,32	23,85	26,49	11,14	7,00	2,38

Table P-1.8. Relative frequencies and average values of potential difficulties affected by MEE

Appendix 1.5. Relative frequencies and average values of features in chapter 1.2.3.3.

Feature	Sample	Grade (%)					AV
		1	2	3	4	5	
Energy efficiency projects reduce the noise from building.	E	3,64	2,28	12,53	48,75	32,80	4,05
	U	5,35	7,69	23,40	38,64	24,93	3,70
Energy efficiency projects reduce the emission of hazardous gasses from building.	E	3,19	1,59	18,22	42,60	34,40	4,03
	U	3,88	7,35	27,87	38,84	22,06	3,68

Buildings where MEEs are implemented affect the improvement of aesthetic features of settlement where I live.	E	2,51	1,37	9,57	41,23	43,33	4,26
	U	2,67	4,21	24,06	36,63	32,42	3,92

Table P-1.9. Relative frequencies and average values of perception of MEE impact to environment protection

Appendix 1.6. Relative frequencies and average values of features in chapter 1.2.3.6.

Feature	Sampl	Grade (%)					AV
	e	1	2	3	4	5	
I am satisfied with average air temperature in building.	E	1,83	2,51	9,82	47,49	38,36	4,18
	U	5,48	6,82	21,19	33,36	33,16	3,82
I am satisfied with ventilation in building.	E	4,12	8,92	23,34	41,65	21,97	3,68
	U	9,97	10,43	30,84	28,16	20,60	3,39
I am satisfied with lights in building.	E	2,05	5,69	15,03	46,47	30,75	3,98
	U	4,68	5,55	27,81	32,09	29,88	3,77
I am satisfied with air quality in building.	E	2,51	4,11	20,78	49,09	23,52	3,87
	U	7,16	11,65	30,79	29,12	21,29	3,46
I am satisfied with air humidity in building.	E	2,51	4,56	24,15	47,15	21,64	3,81
	U	7,09	9,70	35,72	27,96	19,53	3,43
I am satisfied with sound insulation in building.	E	2,28	4,33	16,63	45,33	31,44	3,99
	U	7,95	7,95	28,07	29,41	26,60	3,59
I am satisfied with energy consumption in building.	E	2,51	2,73	24,15	43,74	26,88	3,90
I am satisfied with energy costs in building.	E	2,28	3,87	29,16	39,18	25,51	3,82

Table P-1.10. Satisfaction with features of premises after implementation of MEE in heating season

Feature	Sampl	Grade (%)					AV
	e	1	2	3	4	5	
I am satisfied with average air temperature in building.	E	0,91	3,42	16,40	43,96	35,31	4,09
	U	0,05	0,05	0,28	0,34	0,28	3,74
I am satisfied with ventilation in building.	E	3,42	8,20	27,56	41,46	19,36	3,65
	U	0,09	0,10	0,35	0,29	0,17	3,37
I am satisfied with lights in building.	E	1,60	5,25	20,55	44,06	28,54	3,93
	U	0,04	0,06	0,32	0,33	0,26	3,72
I am satisfied with air quality in building.	E	2,28	3,87	25,97	47,15	20,73	3,80
	U	0,07	0,11	0,35	0,28	0,19	3,41
I am satisfied with air humidity in building.	E	1,82	3,42	29,61	46,92	18,22	3,76
	U	0,06	0,10	0,37	0,29	0,18	3,42
I am satisfied with sound insulation in building.	E	1,37	4,78	20,73	43,51	29,61	3,95
	U	0,08	0,09	0,31	0,29	0,23	3,50
I am satisfied with energy consumption in	E	1,60	2,28	28,77	42,47	24,89	3,87

building.							
I am satisfied with energy costs in building.	E	1,82	3,42	32,35	37,81	24,60	3,80

Table P-1.11. Satisfaction with features of premises after implementation of MEE in interseasons

Feature	Sampl	Grade (%)					AV
	e	1	2	3	4	5	
I am satisfied with average air temperature in building.	E	2,51	5,01	20,50	41,69	30,30	3,92
	U	7,76	9,04	30,39	27,51	25,30	3,54
I am satisfied with ventilation in building.	E	3,42	9,57	29,38	37,13	20,50	3,62
	U	10,37	10,37	34,27	26,71	18,27	3,32
I am satisfied with lights in building.	E	2,28	4,78	21,64	42,60	28,70	3,91
	U	4,75	5,96	31,33	30,59	27,38	3,70
I am satisfied with air quality in building.	E	2,96	4,33	26,65	46,01	20,05	3,76
	U	7,70	11,24	35,21	25,50	20,35	3,40
I am satisfied with air humidity in building.	E	2,73	4,56	29,16	43,96	19,59	3,73
	U	7,23	8,77	39,69	27,04	17,27	3,38
I am satisfied with sound insulation in building.	E	2,73	4,10	21,41	41,46	30,30	3,92
	U	8,44	9,78	32,55	24,92	24,31	3,47
I am satisfied with energy consumption in building.	E	2,28	2,73	29,16	39,86	25,97	3,85
I am satisfied with energy costs in building.	E	2,51	2,73	33,71	35,99	25,06	3,78

Table P-1.12. Satisfaction with features of premises after implementation of MEE in cooling season

Appendix 1.7. Relative frequencies and average values of features and T-test results in chapter 1.2.3.7.

Feature	Sample	Grade (%)					AV
		1	2	3	4	5	
Daily care for energy consumption	1000-	4,03	3,23	8,87	37,10	46,77	4,19
	1000+	1,37	1,37	9,93	37,67	49,66	4,33
More frequent monitoring of daily electricity tariffs	1000-	4,84	6,45	15,32	51,61	21,77	3,79
	1000+	2,40	7,53	25,34	38,70	26,03	3,78
More frequent turning off of the lights and other devices/appliances when the respondent is not in the premises or when s/he does not use them	1000-	6,45	3,23	15,32	41,13	33,87	3,93
	1000+	1,71	6,83	7,53	43,84	40,07	4,14
Encourage the purchase of energy efficient appliances	1000-	8,87	8,87	12,10	47,58	22,58	3,66
	1000+	1,71	2,40	11,64	51,71	32,53	4,11
Installation of more efficient insulation if the funds were available	1000-	2,42	0,81	10,48	35,48	50,81	4,31
	1000+	0,68	1,03	3,08	32,19	63,01	4,56

Table P-1.13. Relative frequencies and average values of MEE impact to behaviour of employees for strata „1.000-“ and „1.000+“

Feature	Sample	Grade (%)					AV
		1	2	3	4	5	
Daily care for energy consumption	1000-	7,05	7,05	19,55	32,37	33,97	3,79
	1000+	6,80	7,28	21,72	34,73	29,47	3,73
More frequent monitoring of daily electricity tariffs	1000-	15,71	18,27	33,65	19,87	12,50	2,95
	1000+	18,85	20,17	29,24	20,64	11,10	2,85
More frequent turning off of the lights and other devices/appliances when the respondent is not in the premises or when s/he does not use them	1000-	6,73	9,62	16,99	33,33	33,33	3,37
	1000+	10,74	10,14	17,06	31,50	30,55	3,61
Encourage the purchase of energy efficient appliances	1000-	10,26	12,82	35,90	26,92	14,10	3,22
	1000+	12,05	15,51	31,15	28,52	12,77	3,14
Installation of more efficient insulation if the funds were available	1000-	4,49	4,49	19,55	35,58	35,90	3,94
	1000+	6,09	4,30	17,17	34,73	37,71	3,94

Table P-1.14. Relative frequencies and average values of MEE impact to behaviour of service users for strata „1.000-“ and „1.000+“

Feature	Sample	*p*	Size of impact	
			Eta square	Size of difference between strata
Daily care for energy consumption	E	**0,00**	0,034	Small to moderate
	U	0,35	0,001	Very small
More frequent monitoring of daily electricity tariffs	E	0,96	0,001	Very small
	U	0,22	0,003	Very small
More frequent turning off of the lights and other devices/appliances when the respondent is not in the premises or when s/he does not use them	E	**0,049**	0,009	Close to small
	U	0,051	0,003	Very small
Encourage the purchase of energy efficient appliances	E	**0,01**	0,018	More than small
	U	0,98	0,000	Exceptionally small
Installation of more efficient insulation if the funds were available	E	0,15	0,005	Very small
	U	0,41	0,001	Very small

Table P-1.15. T-test results on impact of MEE to performance/behaviour of employees and service users between the strata „1.000-“ and „1.000+“

Feature	Sample	Grade (%)					AV
		1	2	3	4	5	
Increased number of people who will lose employment	1000-	23,58	29,27	30,08	11,38	5,69	2,46
	1000+	33,56	27,05	26,03	10,62	2,74	2,22
Increased difficulties for employees in their work	1000-	26,61	33,06	18,55	12,10	9,68	2,45
	1000+	42,81	31,51	14,04	7,53	4,11	1,99

Table P-1.16. Relative frequencies and average values of perception of employees on potential difficulties for people due to implementation of MEE for strata „1.000-“ and „1.000+“

Feature	Sample	Grade (%)					AV
		1	2	3	4	5	
Increased number of people who will lose employment	1000-	26,92	23,40	30,77	12,82	6,09	2,48
	1000+	30,79	22,43	27,80	11,34	7,64	2,43
Increased difficulties for employees in their work	1000-	30,13	25,00	25,00	12,50	7,35	2,42
	1000+	34,37	22,55	27,45	9,43	6,21	2,31

Table P-1.17. Relative frequencies and average values of perception of service users on potential difficulties for people due to implementation of MEE for strata „1.000-„ and „1.000+“

Feature	Sample	*p*	Size of impact	
			Eta square	Size of difference between strata
Increased number of people who will lose employment	Z	**0,04**	0,010	Mala
	K	0,53	0,000	Exceptionally small
Increased difficulties for employees in their work	Z	**0,00**	0,029	Small to moderate
	K	0,16	0,002	Very small

Table P-1.18. T-test results on impact of MEE to perception of potential difficulties for people between the strata „1.000-“ and „1.000+“

Appendix 1.8. Relative frequencies and average values of features in chapter 1.2.3.9.

Feature	Sampl	Grade (%)					AV
	e	1	2	3	4	5	
Patients feel more comfortable in building.	E	0,00	0,00	6,25	40,63	53,13	4,47
	U	0,00	0,00	20,93	39,53	39,53	4,19
Bigger comfort for recovery of patients.	E	0,00	0,00	6,25	46,88	46,88	4,41
	U	0,00	0,00	16,28	41,86	41,86	4,26
Patients are less nervous.	E	3,13	0,00	31,25	31,25	34,38	3,94
	U	0,00	2,33	27,91	32,56	37,21	4,05
Decreased time for provision of different medical services.	E	3,13	6,25	37,50	28,13	25,00	3,66
	U	0,00	6,98	37,21	34,88	20,93	3,70
Increased quality of services.	E	0,00	3,13	25,00	43,75	28,13	3,97
	U	0,00	2,33	30,23	41,86	25,58	3,91
Decreased number of patients' appeals	E	0,00	0,00	21,88	50,00	28,13	4,06
	U	0,00	2,33	41,86	30,23	25,58	3,79

Table P-1.19. Perception of service quality after implementation of MEE in hospitals during the heating season

Feature	Sample	Grade (%)					AV
		1	2	3	4	5	
Patients feel more comfortable in building.	E	0,00	0,00	21,88	46,88	31,25	4,09
	U	0,00	9,30	20,93	39,53	30,23	3,91
Bigger comfort for recovery of patients.	E	0,00	0,00	15,63	53,13	31,25	4,16
	U	0,00	4,65	27,91	37,21	30,23	3,93
Patients are less nervous.	E	3,13	0,00	31,25	40,63	25,00	3,84
	U	0,00	4,65	27,91	37,21	30,23	3,93
Decreased time for provision of different medical services.	E	6,25	0,00	34,38	31,25	28,13	3,75
	U	0,00	16,28	34,88	30,23	18,60	3,51
Increased quality of services.	E	0,00	0,00	28,13	43,75	28,13	4,00
	U	0,00	2,33	32,56	44,19	20,93	3,84
Decreased number of patients' appeals	E	0,00	0,00	18,75	50,00	31,25	4,13
	U	0,00	2,33	37,21	37,21	23,26	3,81

Table P-1.20. Perception of service quality after implementation of MEE in hospitals in interseasons

Feature	Sample	Grade (%)					AV
		1	2	3	4	5	
Patients feel more comfortable in building.	E	3,13	9,38	12,50	43,75	31,25	3,91
	U	0,00	6,98	25,58	37,21	30,23	3,91
Bigger comfort for recovery of patients.	E	0,00	3,13	25,00	46,88	25,00	3,94
	U	0,00	0,00	32,56	32,56	34,88	4,02
Patients are less nervous.	E	3,13	0,00	40,63	40,63	15,63	3,66
	U	0,00	2,33	41,86	25,58	30,23	3,84
Decreased time for provision of different medical services.	E	3,13	0,00	46,88	37,50	12,50	3,56
	U	0,00	9,30	37,21	32,56	20,93	3,65
Increased quality of services.	E	0,00	0,00	37,50	46,88	15,63	3,78
	U	0,00	0,00	34,88	39,53	25,58	3,91
Decreased number of patients' appeals	E	0,00	0,00	37,50	40,63	21,88	3,84
	U	0,00	2,33	32,56	37,21	27,91	3,91

Table P-1.21. Perception of service quality after implementation of MEE in hospitals during the cooling season

Feature	Sample	Grade (%)					AV
		1	2	3	4	5	
Bigger comfort for patient.	E	0,00	0,00	4,00	48,00	48,00	4,44
	U	4,84	1,61	19,35	38,71	35,48	3,98
Less nervousness in waiting rooms.	E	0,00	0,00	16,00	48,00	36,00	4,20
	U	6,45	4,84	20,97	35,48	32,26	3,82
Less appeals by patients.	E	0,00	0,00	24,00	36,00	40,00	4,16
	U	6,45	4,84	24,19	37,10	27,42	3,74
Patients feel more comfortable in building.	E	0,00	4,00	20,00	32,00	44,00	4,16

	U	1,61	3,23	17,74	37,10	40,32	4,11
Decreased time of provision of services.	E	4,00	0,00	24,00	48,00	24,00	3,88
	U	1,61	11,29	33,87	30,65	22,58	3,61
Increased quality of services.	E	0,00	0,00	24,00	44,00	32,00	4,08
	U	3,23	3,23	22,58	37,10	33,87	3,95

Table P-1.22. Perception of service quality after implementation of MEE in health centres during the heating season

Feature	Sample	Grade (%)					AV
		1	2	3	4	5	
Bigger comfort for patient.	E	0,00	4,00	8,00	44,00	44,00	4,28
	U	3,23	1,61	35,48	40,32	19,35	3,71
Less nervousness in waiting rooms.	E	0,00	4,00	28,00	36,00	32,00	3,96
	U	1,61	3,23	46,77	32,26	16,13	3,58
Less appeals by patients.	E	0,00	4,00	20,00	40,00	36,00	4,08
	U	1,61	6,45	41,94	40,32	9,68	3,50
Patients feel more comfortable in building.	E	0,00	8,00	24,00	36,00	32,00	3,92
	U	1,61	1,61	27,42	48,39	20,97	3,85
Decreased time of provision of services.	E	0,00	4,00	20,00	48,00	28,00	4,00
	U	1,61	6,45	43,55	35,48	12,90	3,52
Increased quality of services.	E	0,00	4,00	20,00	40,00	36,00	4,08
	U	1,61	0,00	38,71	32,26	27,42	3,84

Table P-1.23. Perception of service quality after implementation of MEE in health centres during the interseasons

Feature	Sample	Grade (%)					AV
		1	2	3	4	5	
Bigger comfort for patient.	E	0,00	16,00	12,00	44,00	28,00	3,84
	U	4,84	1,61	32,26	41,94	19,35	3,69
Less nervousness in waiting rooms.	E	0,00	8,00	40,00	20,00	32,00	3,76
	U	3,23	8,06	33,87	32,26	22,58	3,63
Less appeals by patients.	E	0,00	8,00	28,00	40,00	24,00	3,80
	U	3,23	4,84	38,71	40,32	12,90	3,55
Patients feel more comfortable in building.	E	0,00	12,00	32,00	20,00	36,00	3,80
	U	1,61	4,84	25,81	43,55	24,19	3,84
Decreased time of provision of services.	E	0,00	4,00	32,00	36,00	28,00	3,88
	U	3,23	9,68	43,55	35,48	8,06	3,35
Increased quality of services.	E	0,00	4,00	24,00	44,00	28,00	3,96
	U	1,61	6,45	29,03	38,71	24,19	3,77

Table P-1.24. Perception of service quality after implementation of MEE in health centres during the cooling season

Feature	Sample	Grade (%)					AV
		1	2	3	4	5	
Users feel more comfortable in building.	E	0,00	0,00	20,00	20,00	60,00	4,40
	U	12,50	0,00	12,50	62,50	12,50	3,63
Bigger comfort for users.	E	0,00	0,00	0,00	20,00	80,00	4,80
	U	12,50	0,00	12,50	50,00	25,00	3,75
Decreased number of users' appeals.	E	0,00	0,00	0,00	80,00	20,00	4,20
	U	12,50	0,00	25,00	37,50	25,00	3,63
Increased quality of services.	E	0,00	0,00	20,00	0,00	80,00	4,60
	U	12,50	0,00	12,50	62,50	12,50	3,63

Table P-1.25. Perception of service quality after implementation of MEE in culture institutions during the heating season

Feature	Sample	Grade (%)					AV
		1	2	3	4	5	
Users feel more comfortable in building.	E	0,00	0,00	20,00	40,00	40,00	4,20
	U	12,50	12,50	12,50	50,00	12,50	3,38
Bigger comfort for users.	E	0,00	0,00	20,00	40,00	40,00	4,20
	U	12,50	0,00	25,00	37,50	25,00	3,63
Decreased number of users' appeals.	E	0,00	0,00	0,00	40,00	60,00	4,60
	U	12,50	0,00	25,00	37,50	25,00	3,63
Increased quality of services.	E	0,00	0,00	0,00	20,00	80,00	4,80
	U	0,00	12,50	25,00	37,50	25,00	3,75

Table P-1.26. Perception of service quality after implementation of MEE in culture institutions during the interseasons

Feature	Sample	Grade (%)					AV
		1	2	3	4	5	
Users feel more comfortable in building.	E	0,00	0,00	40,00	20,00	40,00	4,00
	U	12,50	12,50	12,50	50,00	12,50	3,38
Bigger comfort for users.	E	0,00	0,00	40,00	20,00	40,00	4,00
	U	12,50	0,00	12,50	50,00	25,00	3,75
Decreased number of users' appeals.	E	0,00	0,00	0,00	60,00	40,00	4,40
	U	0,00	0,00	12,50	37,50	50,00	4,38
Increased quality of services.	E	0,00	0,00	0,00	40,00	60,00	4,60
	U	0,00	0,00	25,00	50,00	25,00	4,00

Table P-1.27. Perception of service quality after implementation of MEE in culture institutions during the cooling season

Feature	Sample	Grade (%)					AV
		1	2	3	4	5	
Users feel more comfortable in building.	E	0,00	0,00	20,00	40,00	40,00	4,20

	U	0,00	0,00	40,00	40,00	20,00	3,80
Bigger comfort for users.	E	0,00	0,00	60,00	20,00	20,00	3,60
	U	0,00	0,00	60,00	20,00	20,00	3,60
Decreased number of users' appeals.	E	0,00	0,00	60,00	20,00	20,00	3,60
	U	0,00	0,00	0,00	40,00	60,00	4,60
Increased quality of services.	E	0,00	0,00	40,00	40,00	20,00	3,80
	U	0,00	0,00	0,00	60,00	40,00	4,40
Improved health of users.	E	0,00	0,00	60,00	20,00	20,00	3,60
	U	0,00	0,00	40,00	40,00	20,00	3,80

Table P-1.28. Perception of service quality after implementation of MEE in sport institutions during the heating season

Feature	Sample	Grade (%)					AV
		1	2	3	4	5	
Users feel more comfortable in building.	E	0,00	0,00	0,00	40,00	60,00	4,60
	U	0,00	0,00	40,00	20,00	40,00	4,00
Bigger comfort for users.	E	0,00	0,00	20,00	40,00	40,00	4,20
	U	0,00	0,00	40,00	40,00	20,00	3,80
Decreased number of users' appeals.	E	0,00	0,00	40,00	40,00	20,00	3,80
	U	0,00	20,00	40,00	20,00	20,00	3,40
Increased quality of services.	E	0,00	0,00	60,00	20,00	20,00	3,60
	U	0,00	20,00	20,00	40,00	20,00	3,60
Improved health of users.	E	0,00	0,00	20,00	60,00	20,00	4,00
	U	0,00	0,00	40,00	40,00	20,00	3,80

Table P-1.29. Perception of service quality after implementation of MEE in sport institutions during the interseasons

Feature	Sample	Grade (%)					AV
		1	2	3	4	5	
Users feel more comfortable in building.	E	0,00	0,00	20,00	0,00	80,00	4,60
	U	0,00	0,00	40,00	0,00	60,00	4,20
Bigger comfort for users.	E	0,00	0,00	0,00	60,00	40,00	4,40
	U	0,00	0,00	40,00	40,00	20,00	3,80
Decreased number of users' appeals.	E	0,00	0,00	40,00	0,00	60,00	4,20
	U	0,00	0,00	20,00	40,00	40,00	4,20
Increased quality of services.	E	0,00	0,00	0,00	60,00	40,00	4,40
	U	0,00	20,00	40,00	20,00	20,00	3,40
Improved health of users.	E	0,00	0,00	20,00	20,00	60,00	4,40
	U	0,00	0,00	20,00	80,00	0,00	3,80

Table P-1.30. Perception of service quality after implementation of MEE in sport institutions during the cooling season

Feature	Sample	Grade (%)					AV
		1	2	3	4	5	
Less nervousness at window tellers.	E	6,45	0,00	12,90	54,84	25,81	3,94
	U	3,03	6,06	39,39	39,39	12,12	3,52
Less appeals by citizens to the work of employees.	E	3,23	3,23	29,03	41,94	22,58	3,77
	U	3,03	3,03	54,55	27,27	12,12	3,42
Citizens feel comfortable in building.	E	3,23	0,00	9,68	41,94	45,16	4,26
	U	0,00	0,00	30,30	48,48	21,21	3,91
Bigger comfort for citizens.	E	0,00	0,00	19,35	35,48	45,16	4,26
	U	0,00	3,03	24,24	48,48	24,24	3,94
Decreased time of service provision.	E	0,00	6,45	41,94	32,26	19,35	3,65
	U	9,09	6,06	51,52	27,27	6,06	3,15
Increased quality of services.	E	0,00	0,00	22,58	51,61	25,81	4,03
	U	9,09	3,03	30,30	48,48	9,09	3,45

Table P-1.31. Perception of service quality after implementation of MEE in public administration during the heating season

Feature	Sample	Grade (%)					AV
		1	2	3	4	5	
Less nervousness at window tellers.	E	3,23	0,00	35,48	41,94	19,35	3,74
	U	0,00	6,06	45,45	42,42	6,06	3,48
Less appeals by citizens to the work of employees.	E	0,00	3,23	38,71	41,94	16,13	3,71
	U	3,03	3,03	54,55	30,30	9,09	3,39
Citizens feel comfortable in building.	E	0,00	3,23	16,13	48,39	32,26	4,10
	U	3,03	0,00	33,33	42,42	21,21	3,79
Bigger comfort for citizens.	E	0,00	0,00	29,03	38,71	32,26	4,03
	U	0,00	3,03	24,24	57,58	15,15	3,85
Decreased time of service provision.	E	0,00	6,45	48,39	32,26	12,90	3,52
	U	9,09	6,06	51,52	27,27	6,06	3,15
Increased quality of services.	E	0,00	0,00	29,03	51,61	19,35	3,90
	U	6,06	3,03	36,36	51,52	3,03	3,42

Table P-1.32. Perception of service quality after implementation of MEE in public administration during the interseasons

Feature	Sample	Grade (%)					AV
		1	2	3	4	5	
Less nervousness at window tellers.	E	9,68	6,45	25,81	32,26	25,81	3,58
	U	6,06	9,09	45,45	30,30	9,09	3,27
Less appeals by citizens to the work of employees.	E	3,23	6,45	38,71	32,26	19,35	3,58
	U	3,03	6,06	54,55	24,24	12,12	3,36
Citizens feel comfortable in building.	E	6,45	12,90	16,13	35,48	29,03	3,68
	U	3,03	0,00	51,52	24,24	21,21	3,61

Bigger comfort for citizens.	E	3,23	9,68	29,03	29,03	29,03	3,71
	U	3,03	3,03	33,33	45,45	15,15	3,67
Decreased time of service provision.	E	0,00	19,35	41,94	25,81	12,90	3,32
	U	12,12	6,06	45,45	33,33	3,03	3,09
Increased quality of services.	E	0,00	9,68	29,03	45,16	16,13	3,68
	U	12,12	3,03	39,39	42,42	3,03	3,21

Table P-1.33. Perception of service quality after implementation of MEE in public administration during the cooling season

Feature	Sample	Grade (%)					AV
		1	2	3	4	5	
Students feel more comfortable while staying in school.	E	0,00	0,00	0,00	60,00	40,00	4,40
	U	0,00	0,00	0,00	30,00	70,00	4,70
Improved quality of lessons.	E	0,00	0,00	0,00	60,00	40,00	4,40
	U	0,00	0,00	0,00	20,00	80,00	4,80
Students are more active at lessons.	E	0,00	0,00	20,00	60,00	20,00	4,00
	U	0,00	0,00	10,00	30,00	60,00	4,50
Students achieve better results.	E	0,00	20,00	0,00	60,00	20,00	3,80
	U	0,00	0,00	10,00	30,00	60,00	4,50
Improved health of students which results with decrease of absences in general.	E	0,00	0,00	0,00	60,00	40,00	4,40
	U	0,00	0,00	10,00	30,00	60,00	4,50
Better use of all school premises.	E	0,00	0,00	0,00	40,00	60,00	4,60
	U	0,00	0,00	0,00	20,00	80,00	4,80

Table P-1.34. Perception of service quality after implementation of MEE in schools for children with special needs during the heating season

Feature	Sample	Grade (%)					AV
		1	2	3	4	5	
Students feel more comfortable while staying in school.	E	0,00	0,00	0,00	80,00	20,00	4,20
	U	0,00	0,00	0,00	30,00	70,00	4,70
Improved quality of lessons.	E	0,00	0,00	0,00	100,00	0,00	4,00
	U	0,00	0,00	0,00	30,00	70,00	4,70
Students are more active at lessons.	E	0,00	0,00	20,00	80,00	0,00	3,80
	U	0,00	0,00	10,00	40,00	50,00	4,40
Students achieve better results.	E	0,00	20,00	0,00	80,00	0,00	3,60
	U	0,00	0,00	10,00	40,00	50,00	4,40
Improved health of students which results with decrease of absences in general.	E	0,00	0,00	0,00	100,00	0,00	4,00
	U	0,00	0,00	10,00	30,00	60,00	4,50
Better use of all school premises.	E	0,00	0,00	0,00	80,00	20,00	4,20
	U	0,00	0,00	0,00	30,00	70,00	4,70

Table P-1.35. Perception of service quality after implementation of MEE in schools for children with special needs during the interseasons

Feature	Sample	Grade (%)					AV
		1	2	3	4	5	
Students feel more comfortable while staying in school.	E	0,00	0,00	20,00	80,00	0,00	3,80
	U	0,00	0,00	0,00	40,00	60,00	4,60
Improved quality of lessons.	E	0,00	0,00	20,00	80,00	0,00	3,80
	U	0,00	0,00	0,00	40,00	60,00	4,60
Students are more active at lessons.	E	0,00	0,00	40,00	60,00	0,00	3,60
	U	0,00	0,00	10,00	40,00	50,00	4,40
Students achieve better results.	E	0,00	20,00	20,00	60,00	0,00	3,40
	U	0,00	0,00	10,00	40,00	50,00	4,40
Improved health of students which results with decrease of absences in general.	E	0,00	0,00	20,00	80,00	0,00	3,80
	U	0,00	0,00	10,00	30,00	60,00	4,50
Better use of all school premises.	E	0,00	0,00	40,00	60,00	0,00	3,60
	U	0,00	0,00	0,00	30,00	70,00	4,70

Table P-1.36. Perception of service quality after implementation of MEE in schools for children with special needs during the cooling season

Feature	Sample	Grade (%)					AV
		1	2	3	4	5	
Students feel more comfortable while staying in school.	E	3,32	2,49	6,22	41,91	46,06	4,25
	U	5,65	4,38	18,30	30,02	41,65	3,98
Improved quality of lessons.	E	2,90	2,90	13,28	46,06	34,85	4,07
	U	6,24	5,99	27,15	31,70	28,92	3,71
Students are more active at lessons.	E	3,32	2,90	24,90	45,23	23,65	3,83
	U	7,08	9,78	36,51	26,31	20,32	3,43
Students achieve better results.	E	2,07	5,39	33,20	40,25	19,09	3,69
	U	6,58	8,94	38,87	25,89	19,73	3,43
Improved health of students which results with decrease of absences in general.	E	2,90	2,49	23,24	43,15	28,22	3,91
	U	6,41	8,35	28,58	32,55	24,11	3,60
Better use of all school premises.	E	2,49	3,73	10,79	43,15	39,83	4,14
	U	5,07	5,83	32,52	30,15	26,44	3,67

Table P-1.37. Perception of service quality after implementation of MEE in schools during the heating season

Feature	Sample	Grade (%)					AV
		1	2	3	4	5	
Students feel more comfortable while staying in school.	E	3,32	2,90	14,52	44,40	34,85	4,05
	U	5,15	4,64	32,83	31,22	26,16	3,69
Improved quality of lessons.	E	2,07	3,73	23,65	41,49	29,05	3,92
	U	4,89	7,26	35,53	30,21	22,11	3,57
Students are more active at lessons.	E	1,66	3,73	31,12	43,15	20,33	3,77

	U	5,91	10,04	43,21	26,08	14,77	3,34
Students achieve better results.	E	1,66	5,39	36,51	40,66	15,77	3,63
	U	6,50	9,54	44,17	25,08	14,70	3,32
Improved health of students which results with decrease of absences in general.	E	1,67	3,75	27,50	42,08	25,00	3,85
	U	5,75	9,21	34,49	31,11	19,44	3,49
Better use of all school premises.	E	2,49	2,90	15,77	44,81	34,02	4,05
	U	4,73	6,92	34,68	31,90	21,77	3,59

Table P-1.38. Perception of service quality after implementation of MEE in schools during the interseasons

Feature	Sample	Grade (%)					AV
		1	2	3	4	5	
Students feel more comfortable while staying in school.	E	4,15	4,98	19,09	41,91	29,88	3,88
	U	11,74	11,15	27,03	25,34	24,75	3,40
Improved quality of lessons.	E	2,51	3,77	24,69	43,10	25,94	3,86
	U	8,54	9,81	35,67	24,18	21,81	3,41
Students are more active at lessons.	E	3,32	4,98	31,54	41,91	18,26	3,67
	U	8,20	11,83	44,04	20,96	14,96	3,23
Students achieve better results.	E	3,73	5,39	36,93	39,00	14,94	3,56
	U	9,71	10,22	43,58	20,95	15,54	3,22
Improved health of students which results with decrease of absences in general.	E	3,32	2,49	31,95	39,42	22,82	3,76
	U	8,02	9,46	35,30	27,53	19,68	3,41
Better use of all school premises.	E	2,90	4,98	17,43	45,23	29,46	3,93
	U	6,42	6,50	35,39	30,07	21,62	3,54

Table P-1.39. Perception of service quality after implementation of MEE in schools during the cooling season

Feature	Sample	Grade (%)					AV
		1	2	3	4	5	
Students feel more comfortable while staying at faculty.	E	11,76	0,00	23,53	52,94	11,76	3,53
	U	2,86	12,86	20,00	38,57	25,71	3,71
Improved quality of lessons.	E	11,76	0,00	35,29	35,29	17,65	3,47
	U	5,71	14,29	30,00	32,86	17,14	3,41
Students are more active at lessons.	E	11,76	0,00	52,94	29,41	5,88	3,18
	U	7,14	14,29	40,00	18,57	20,00	3,30
Students achieve better results.	E	11,76	0,00	47,06	23,53	17,65	3,35
	U	11,43	10,00	41,43	17,14	20,00	3,24
Improved health of students which results with decrease of absences in general.	E	11,76	0,00	35,29	52,94	0,00	3,29
	U	7,14	11,43	30,00	35,71	15,71	3,41
Better use of all faculty premises.	E	11,76	0,00	35,29	35,29	17,65	3,47
	U	8,57	11,43	31,43	31,43	17,14	3,37

Table P-1.40. Perception of service quality after implementation of MEE in faculties during the heating season

Feature	Sample	Grade (%)					AV
		1	2	3	4	5	
Students feel more comfortable while staying at faculty.	E	5,88	0,00	35,29	35,29	23,53	3,71
	U	0,00	4,29	35,71	40,00	20,00	3,76
Improved quality of lessons.	E	5,88	0,00	41,18	35,29	17,65	3,59
	U	5,71	11,43	41,43	27,14	14,29	3,33
Students are more active at lessons.	E	5,88	0,00	58,82	29,41	5,88	3,29
	U	8,57	8,57	47,14	21,43	14,29	3,24
Students achieve better results.	E	5,88	0,00	52,94	23,53	17,65	3,47
	U	11,43	10,00	45,71	15,71	17,14	3,17
Improved health of students which results with decrease of absences in general.	E	5,88	0,00	41,18	52,94	0,00	3,41
	U	7,14	8,57	37,14	35,71	11,43	3,36
Better use of all faculty premises.	E	5,88	0,00	41,18	29,41	23,53	3,65
	U	7,14	7,14	37,14	28,57	20,00	3,47

Table P-1.41. Perception of service quality after implementation of MEE in faculties during the interseasons

Feature	Sample	Grade (%)					AV
		1	2	3	4	5	
Students feel more comfortable while staying at faculty.	E	5,88	0,00	29,41	41,18	23,53	3,76
	U	0,00	12,86	35,71	35,71	15,71	3,54
Improved quality of lessons.	E	5,88	0,00	29,41	52,94	11,76	3,65
	U	5,71	12,86	38,57	32,86	10,00	3,29
Students are more active at lessons.	E	5,88	0,00	47,06	47,06	0,00	3,35
	U	10,00	8,57	50,00	21,43	10,00	3,13
Students achieve better results.	E	5,88	0,00	47,06	35,29	11,76	3,47
	U	14,29	5,71	50,00	18,57	11,43	3,07
Improved health of students which results with decrease of absences in general.	E	5,88	0,00	41,18	52,94	0,00	3,41
	U	5,71	10,00	41,43	31,43	11,43	3,33
Better use of all faculty premises.	E	5,88	0,00	47,06	29,41	17,65	3,53
	U	5,71	8,57	38,57	28,57	18,57	3,46

Table P-1.42. Perception of service quality after implementation of MEE in faculties during the cooling season

Feature	Sample	Grade (%)					AV
		1	2	3	4	5	
Users feel more comfortable in building.	E	6,67	0,00	13,33	53,33	26,67	3,93
	U	0,00	0,00	18,18	0,00	81,82	4,64
Bigger comfort for users.	E	0,00	0,00	13,33	80,00	6,67	3,93
	U	0,00	0,00	27,27	9,09	63,64	4,36
Decreased number of users' appeals.	E	0,00	0,00	13,33	66,67	20,00	4,07

	U	0,00	0,00	18,18	18,18	63,64	4,45
Better socializing between the users.	E	0,00	0,00	26,67	60,00	13,33	3,87
	U	0,00	9,09	18,18	0,00	72,73	4,36
Increased quality of service.	E	0,00	0,00	20,00	60,00	20,00	4,00
	U	9,09	0,00	18,18	0,00	72,73	4,27
Improved health of users.	E	0,00	0,00	20,00	50,00	30,00	4,10
	U	0,00	0,00	18,18	0,00	81,82	4,64

Table P-1.43. Perception of service quality after implementation of MEE in all-day accommodation & nursing centres during the heating season

Feature	Sample	Grade (%)					AV
		1	2	3	4	5	
Users feel more comfortable in building.	E	0,00	0,00	6,67	66,67	26,67	4,20
	U	0,00	0,00	18,18	9,09	72,73	4,55
Bigger comfort for users.	E	0,00	0,00	13,33	66,67	20,00	4,07
	U	0,00	0,00	18,18	0,00	81,82	4,64
Decreased number of users' appeals.	E	0,00	0,00	13,33	66,67	20,00	4,07
	U	0,00	0,00	9,09	18,18	72,73	4,64
Better socializing between the users.	E	0,00	0,00	26,67	46,67	26,67	4,00
	U	0,00	9,09	9,09	9,09	72,73	4,45
Increased quality of service.	E	0,00	0,00	26,67	53,33	20,00	3,93
	U	9,09	0,00	9,09	9,09	72,73	4,36
Improved health of users.	E	0,00	0,00	0,00	50,00	50,00	4,50
	U	0,00	0,00	27,27	0,00	72,73	4,45

Table P-1.44. Perception of service quality after implementation of MEE in all-day accommodation & nursing centres during the interseasons

Feature	Sample	Grade (%)					AV
		1	2	3	4	5	
Users feel more comfortable in building.	E	0,00	0,00	20,00	53,33	26,67	4,07
	U	0,00	0,00	18,18	9,09	72,73	4,55
Bigger comfort for users.	E	0,00	0,00	20,00	73,33	6,67	3,87
	U	0,00	0,00	27,27	9,09	63,64	4,36
Decreased number of users' appeals.	E	0,00	0,00	13,33	66,67	20,00	4,07
	U	0,00	0,00	18,18	9,09	72,73	4,55
Better socializing between the users.	E	0,00	0,00	26,67	46,67	26,67	4,00
	U	0,00	9,09	18,18	0,00	72,73	4,36
Increased quality of service.	E	0,00	0,00	6,67	66,67	26,67	4,20
	U	9,09	0,00	18,18	0,00	72,73	4,27
Improved health of users.	E	0,00	0,00	30,00	40,00	30,00	4,00
	K	0,00	0,00	27,27	0,00	72,73	4,45

Table P-1.45. Perception of service quality after implementation of MEE in all-day accommodation & nursing centres during the cooling season

Feature	Sample	Grade (%)					AV
		1	2	3	4	5	
Children feel more comfortable while staying in kindergarten.	E	0,00	1,72	8,62	37,93	51,72	4,40
	U	0,00	0,00	11,11	38,10	50,79	4,40
Children are more active.	E	0,00	0,00	6,90	37,93	55,17	4,48
	U	0,00	1,59	15,87	46,03	36,51	4,17
Due to implemented energy efficiency measures parents are more satisfied.	E	0,00	0,00	6,90	32,76	60,34	4,53
	U	0,00	0,00	9,52	36,51	53,97	4,44
Improved health of children which results with decrease of absences in general.	E	0,00	0,00	17,24	32,76	50,00	4,33
	U	0,00	1,59	15,87	44,44	38,10	4,19
Better use of all premises in kindergarten.	E	0,00	0,00	6,90	37,93	55,17	4,48
	U	0,00	1,59	15,87	33,33	49,21	4,30
Improved quality of educational process.	E	0,00	0,00	12,28	36,84	50,88	4,39
	U	0,00	3,17	14,29	39,68	42,86	4,22

Table P-1.46. Perception of service quality after implementation of MEE in kindergartens during the heating season

Feature	Sample	Grade (%)					AV
		1	2	3	4	5	
Children feel more comfortable while staying in kindergarten.	E	0,00	0,00	17,24	36,21	46,55	4,29
	U	0,00	3,17	15,87	31,75	49,21	4,27
Children are more active.	E	0,00	0,00	17,54	31,58	50,88	4,33
	U	0,00	0,00	20,63	41,27	38,10	4,17
Due to implemented energy efficiency measures parents are more satisfied.	E	1,72	0,00	15,52	31,03	51,72	4,31
	U	0,00	0,00	12,70	39,68	47,62	4,35
Improved health of children which results with decrease of absences in general.	E	0,00	0,00	24,14	31,03	44,83	4,21
	U	0,00	0,00	23,81	34,92	41,27	4,17
Better use of all premises in kindergarten.	E	0,00	0,00	15,52	34,48	50,00	4,34
	U	0,00	0,00	19,05	39,68	41,27	4,22
Improved quality of educational process.	E	0,00	0,00	17,54	33,33	49,12	4,32
	U	0,00	3,17	25,40	34,92	36,51	4,05

Table P-1.47. Perception of service quality after implementation of MEE in kindergartens during the interseasons

Feature	Sample	Grade (%)					AV
		1	2	3	4	5	
Children feel more comfortable while staying in kindergarten.	E	0,00	0,00	17,24	43,10	39,66	4,22
	U	0,00	1,59	17,46	34,92	46,03	4,25
Children are more active.	E	0,00	0,00	20,69	32,76	46,55	4,26
	U	0,00	0,00	17,46	42,86	39,68	4,22
Due to implemented energy efficiency measures parents are more satisfied.	E	0,00	0,00	13,79	31,03	55,17	4,41
	U	0,00	0,00	11,11	36,51	52,38	4,41

Improved health of children which results with decrease of absences in general.	E	0,00	0,00	25,86	27,59	46,55	4,21
	U	0,00	0,00	26,98	33,33	39,68	4,13
Better use of all premises in kindergarten.	E	0,00	0,00	12,07	36,21	51,72	4,40
	U	0,00	0,00	15,87	38,10	46,03	4,30
Improved quality of educational process.	E	0,00	0,00	21,05	28,07	50,88	4,30
	U	0,00	4,76	23,81	31,75	39,68	4,06

Table P-1.48. Perception of service quality after implementation of MEE in kindergartens during the cooling season

Appendix 1.9. Relative frequencies and average values of features and ANOVA test results in chapter 1.3.3.

Feature	Sample	Grade (%)					AV
		1	2	3	4	5	
The decision makers consulted me when planning the MEE.	E	9,70	16,86	24,94	33,03	15,47	3,28
	U	31,88	16,58	23,32	15,44	7,79	2,51
I was informed during planning of MEE.	E	4,61	14,52	20,28	41,94	21,66	3,65
	U	21,60	16,10	24,82	25,55	11,94	2,90
I was actively involved in implementation of MEE in organisation.	E	5,99	16,82	22,12	32,03	23,04	3,49
	U	34,59	20,85	23,92	13,60	7,04	2,38
I was informed during implementation of MEE in organisation.	E	6,22	10,60	16,59	41,94	24,65	3,68
	U	20,78	17,02	24,54	25,22	12,44	2,92
The priorities proposed by female employees were taken into consideration when planning the EE measures in organisation.	E	7,62	14,32	36,95	27,02	14,06	3,26
After implementation of MEE, the work conditions in organisation suited more to my needs.	E	3,69	8,76	22,81	38,94	25,81	3,74

Table P-1.49. Relative frequencies and average values for involvement of employees and service users in planning and implementing specific MEE

Feature	Sample	Grade (%)					PV
		1	2	3	4	5	
I was informed about future energy efficiency projects in this building.	E	7,44	12,56	19,07	39,77	21,16	3,55
	U	26,63	19,62	28,50	16,68	8,48	2,61
I was actively involved in planning of future	E	6,98	17,21	24,65	31,63	19,53	3,40

energy efficiency projects in this building.	U	31,78	22,01	24,95	12,85	8,41	2,44
The priorities proposed by female employees were taken into consideration in future energy efficiency projects in this building.	E	8,60	14,88	33,26	27,91	15,35	3,27

Table P-1.50. Relative frequencies and average values for involvement of employees and service users in further MEE activities in specific building

Feature	Sample	*p*-value			
		Post	Educational degree	Building of residence	Place of residence
The decision makers consulted me when planning the MEE.	E	**0,00**	0,89	0,16	0,28
	U	-	**0,00**	0,31	**0,00**
I was informed during planning of MEE.	E	0,09	0,50	0,94	0,09
	U	-	**0,01**	0,44	0,09
I was actively involved in implementation of MEE in organisation.	E	**0,00**	0,79	0,09	0,07
	U		**0,00**	0,06	**0,01**
I was informed during implementation of MEE in organisation.	E	**0,02**	0,17	0,68	**0,03**
	U		0,27	**0,01**	0,19
The priorities proposed by female employees were taken into consideration when planning the EE measures in organisation.	E	0,07	0,71	0,71	**0,049**
After implementation of MEE, the work conditions in organisation suited more to my needs.	E	0,20	0,16	0,66	0,06

Table P-1.51. ANOVA test results on transparency in implementation of specific MEE project for employees and service users

Feature	Sample	*P-value*			
		and post	Educational degree	Building of residence	Place of residence
I was informed about future energy efficiency projects in this building.	E	**0,00**	0,24	0,86	0,06
	U		**0,00**	**0,03**	**0,00**
I was actively involved in planning of future energy efficiency projects in this building.	E	**0,00**	0,62	0,45	0,45
	U		**0,00**	**0,00**	**0,00**
The priorities proposed by female employees were taken into consideration in future energy efficiency projects in this building.	E	**0,00**	0,51	0,44	0,14

Table P-1.52. ANOVA test results on transparency of the following MEE for employees and service users

APPENDIX 2

Appendix 2.1. Relative frequencies and average values of features and T-test results in chapter 2.1.

Feature	Sample	Grade (%)					AV
		1	2	3	4	5	
Men and women have equal opportunities to participate at energy efficiency trainings.	E	4,10	2,96	12,53	40,55	39,86	4,09
	U	4,41	4,95	18,05	31,95	40,64	3,99
Men and women have equal opportunities to participate professionally in decision making related to energy efficiency.	E	2,73	5,92	15,03	39,18	37,13	4,02
	U	4,75	5,55	20,45	32,69	36,56	3,91
In environments where women decide on energy consumption, savings in energy costs are higher.	E	5,01	9,11	31,89	25,06	28,93	3,64
	U	10,31	11,05	32,62	21,03	24,98	3,39
Women play a crucial role in advocacy for and representation of energy use from renewable sources.	E	6,15	11,39	37,36	27,56	17,54	3,39
	U	9,83	11,44	42,54	21,47	14,72	3,20
Women are more sensitive than men when it comes to understanding the impact of energy efficiency to environment.	E	4,57	9,82	33,11	31,28	21,23	3,55
	U	7,69	8,22	31,55	29,08	23,46	3,52
Women are more sensitive than men when it comes to understanding the relation between energy consumption and climate changes.	E	5,24	10,48	36,67	28,02	19,59	3,46
	U	7,69	10,49	36,36	26,34	19,12	3,39

Table P-2.1. Summary of general attitudes on impact of MEE to gender equality for employees and service users

Feature	Sample	Gender	Grade (%)					AV
			1	2	3	4	5	
Men and women have equal opportunities to participate at energy efficiency trainings.	E	M	6,18	2,81	11,24	42,70	37,08	4,02
		F	2,71	3,10	13,57	39,53	41,09	4,13
Men and women have equal opportunities to participate professionally in decision making related to energy efficiency.	U	M	4,70	5,70	19,37	33,62	36,61	3,92
		F	4,18	4,30	16,84	30,51	44,18	4,06
In environments where women decide on energy consumption, savings in energy costs are higher.	E	M	5,06	5,62	10,67	46,07	32,58	3,96
		F	1,16	6,20	18,22	34,50	39,92	4,06
Women play a crucial role in advocacy for and representation of energy use from renewable sources.	U	M	5,56	5,70	23,36	34,19	31,20	3,80
		F	4,05	5,44	17,97	31,27	41,27	4,00
Women are more sensitive than men	E	M	10,67	10,67	35,96	24,16	18,54	3,29

when it comes to understanding the impact of energy efficiency to environment.		F	0,78	8,14	29,07	25,97	36,05	3,88
	U	M	16,17	13,88	35,34	19,74	14,88	3,03
		F	5,19	8,48	30,25	22,28	33,80	3,71
Women are more sensitive than men when it comes to understanding the relation between energy consumption and climate changes.								
Men and women have equal opportunities to participate at energy efficiency trainings.	E	M	11,24	13,48	37,64	24,16	13,48	3,15
		F	2,33	10,08	37,21	29,84	20,54	3,56
	U	M	14,96	13,96	40,17	20,80	10,11	2,97
Men and women have equal opportunities to participate professionally in decision making related to energy efficiency.		F	5,32	9,25	44,74	21,93	18,76	3,39
In environments where women decide on energy consumption, savings in energy costs are higher.	E	M	8,99	13,48	34,27	28,09	15,17	3,27
		F	1,17	7,00	32,68	33,85	25,29	3,75
	U	M	9,54	10,26	32,34	28,35	19,52	3,38
Women play a crucial role in advocacy for and representation of energy use from renewable sources.		F	6,08	6,46	30,89	29,62	26,96	3,65
Women are more sensitive than men when it comes to understanding the impact of energy efficiency to environment.	E	M	8,99	13,48	35,96	28,65	12,92	3,23
		F	2,33	8,14	37,60	27,91	24,03	3,63
	U	M	10,11	12,68	36,32	24,22	16,67	3,25
		F	5,57	8,61	36,33	28,35	21,14	3,51

Table P-2.2. Summary of general attitudes on impact of MEE to gender equality for employees and service users – per gender of respondent

Feature	Sample	*p*	Size of impact	
			Eta square	Size of difference between groups
Men and women have equal opportunities to participate at energy efficiency trainings.	E	0,24	0,003	Very small
	U	**0,01**	0,004	Very small
Men and women have equal opportunities to participate professionally in decision making related to energy efficiency.	E	0,29	0,003	Very small
	U	**0,00**	0,009	Almost small
In environments where women decide on energy consumption, savings in energy costs are higher.	E	**0,00**	0,066	More than moderate
	U	**0,00**	0,072	More than moderate
Women play a crucial role in advocacy for and representation of energy use from renewable sources.	E	**0,00**	0,034	Small to moderate
	U	**0,00**	0,035	Small to

				moderate
Women are more sensitive than men when it comes to understanding the impact of energy efficiency to environment.	E	**0,00**	0,047	Small to moderate
	U	**0,00**	0,013	More than small
Women are more sensitive than men when it comes to understanding the relation between energy consumption and climate changes.	E	**0,00**	0,034	Small to moderate
	U	**0,00**	0,013	More than small

Table P-2.3. T-test results on gender equality for employees and service users

Appendix 2.2. Relative frequencies and average values of features and T-test results in chapter 2.2.1.

Feature	Sample	Stratum	Grade (%)					AV
			1	2	3	4	5	
The decision makers consulted me when planning the EE measures.	E	M	9,60	12,43	23,16	37,85	16,95	3,40
		F	9,49	20,16	26,48	29,64	14,23	3,19
	U	M	33,24	15,33	27,51	15,76	8,17	2,50
		F	30,84	17,77	28,81	15,23	7,36	2,51
I was informed during planning of EE measures.	E	M	4,49	9,55	19,66	41,57	24,72	3,72
		F	4,74	13,04	20,55	42,29	19,37	3,58
	U	M	23,21	14,33	23,35	26,22	12,89	2,91
		F	20,28	17,62	26,11	24,84	11,15	2,89
The priorities proposed by female employees were taken into consideration when planning the EE measures in organisation.	E	M	8,47	12,99	34,46	32,20	11,86	3,26
		F	7,11	15,42	38,74	23,32	15,42	3,25
I was actively involved in implementation of EE measures in organisation.	E	M	5,62	10,67	16,85	37,08	29,78	3,75
		F	6,32	21,34	26,09	27,67	18,58	3,31
	U	M	36,77	17,30	22,97	14,97	7,99	2,40
		F	32,81	23,99	24,64	12,32	6,23	2,35
I was informed during implementation of EE measures in organisation.	E	M	8,43	7,87	12,92	44,94	25,84	3,72
		F	4,74	12,65	19,37	39,53	23,72	3,65
	U	M	21,66	13,37	24,71	26,16	14,10	2,98
		F	20,10	20,10	24,38	24,38	11,02	2,86
After implementation of EE measures, the work conditions in organisation suited more to my needs.	E	M	6,74	8,99	20,79	41,01	22,47	3,63
		F	1,58	8,70	24,11	37,94	27,67	3,81

Table P-2.4. Overview of attitudes on gender equality in implementation of specific MEE

Feature	Sample	*p*	Size of impact	
			Eta square	Size of difference between groups
The decision makers consulted me when planning the EE measures.	E	0,07	0,008	Very small
	U	0,97	0,000	Exceptionally small
I was informed during planning of EE measures.	E	0,19	0,004	Very small
	U	0,74	0,000	Exceptionally small
The priorities proposed by female employees were taken into consideration when planning the EE measures.	E	0,89	0,000	Exceptionally small
I was actively involved in implementation of EE measures in this building.	E	**0,00**	0,033	Small to moderate
	U	0,46	0,000	Exceptionally small
I was informed during implementation of EE measures in organisation.	E	0,53	0,001	Very small
	U	0,10	0,002	Very small
After implementation of EE measures, the work conditions in organisation suited more to my needs.	E	0,08	0,007	Very small

Table P-2.5. T-test results on gender equality in planning and implementation of MEE

Appendix 2.3. Relative frequencies and average values of features and T-test results in chapter 2.2.2.

Feature	Sample	Stratum	Grade (%)					AV
			1	2	3	4	5	
I was informed about future energy efficiency projects in this building.	E	M	9,83	10,40	13,29	42,77	23,70	3,60
		F	5,91	14,17	23,23	37,40	19,29	3,50
	U	M	29,22	16,57	26,02	18,31	9,88	2,63
		F	24,64	22,18	30,74	15,18	7,26	2,58
I was actively involved in planning of future energy efficiency projects in this building.	E	M	8,67	12,14	16,76	40,46	21,97	3,55
		F	5,91	20,87	30,31	24,80	18,11	3,28
	U	M	34,45	19,77	22,53	12,94	10,32	2,45
		F	29,57	23,87	26,98	12,84	6,74	2,43
The priorities proposed by female employees were taken into consideration in future energy efficiency projects in this building.	E	M	10,40	12,72	28,90	33,53	14,45	3,29
		F	7,48	16,54	36,61	23,62	15,75	3,24

Table P-2.6. Overview of gender equality attitudes in further activities related to MEE

Feature	Sample	*p*	Size of impact	
			Eta square	Size of difference between groups
I was informed about future energy efficiency projects in this building.	E	0,32	0,002	Very small
	U	0,47	0,000	Exceptionally small
I was actively involved in planning of future energy efficiency projects in this building.	E	**0,02**	0,012	More than small
	U	0,81	0,000	Exceptionally small
The priorities proposed by female employees were taken into consideration in future energy efficiency projects in this building.	E	0,64	0,001	Very small

Table P-2.7. T-test results on gender equality in further MEE activities

Appendix 2.4. Relative frequencies and average values of features and T-test results in chapter 2.3.1.

Feature	Sample	Stratum	Grade (%)					AV
			1	2	3	4	5	
My health condition stabilized.	E	M	2,81	5,06	31,46	42,13	18,54	3,69
		F	1,58	5,53	33,99	40,32	18,58	3,69
	U	M	7,45	9,60	33,81	29,94	19,20	3,44
		F	4,44	8,24	37,26	30,04	20,03	3,53
My work capacities increased.	E	M	3,98	3,98	19,32	46,02	26,70	3,88
		F	1,59	5,16	17,86	45,24	30,16	3,97
	U	M	9,31	11,60	32,95	31,23	14,90	3,31
		F	6,72	9,51	34,22	34,85	14,70	3,41
I am more active during my stay in the building.	E	M	3,37	1,69	17,42	46,63	30,90	4,00
		F	1,19	1,98	16,21	44,27	36,36	4,13
	U	M	8,60	12,46	26,79	35,82	16,33	3,39
		F	5,45	13,05	24,46	35,99	21,04	3,54
I feel that I have more energy for performance of activities in the building.	E	M	3,93	1,12	16,29	54,49	24,16	3,94
		F	0,79	1,98	19,37	43,87	33,99	4,08
	U	M	6,60	12,77	26,11	35,72	18,79	3,47
		F	4,18	11,03	27,63	36,12	21,04	3,59
I am less tired when performing activities in the building.	E	M	3,39	2,26	23,16	48,02	23,16	3,85
		F	1,19	2,37	26,48	47,83	22,13	3,87
	U	M	8,60	12,18	35,53	31,66	12,03	3,26
		F	6,59	13,05	36,88	29,78	13,69	3,31

I perform activities better and faster during my stay in the building.	E	M	3,39	2,82	12,43	55,37	25,99	3,98
		F	1,58	3,56	20,95	50,20	23,72	3,91
	U	M	6,03	11,33	34,58	33,57	14,49	3,39
		F	4,18	10,52	32,19	36,63	16,48	3,51

Table P-2.8. Overview of gender equality attitudes regarding impact of MEE to physical health

Feature	Sample	*p*	Size of impact	
			Eta square	Size of difference between groups
My health conditions stabilized.	E	0,98	0,000	Exceptionally small
	U	0,11	0,002	Very small
My work capacities increased	E	0,29	0,003	Very small
	U	0,07	0,002	Very small
I am more active at work	E	0,14	0,005	Very small
	U	**0,01**	0,005	Very small
I feel that I have more energy for performance of daily work duties in the building	E	0,08	0,007	Very small
	U	**0,045**	0,003	Very small
I am less tired when performing daily duties in the building	E	0,81	0,000	Exceptionally small
	U	0,42	0,000	Exceptionally small
I perform daily duties at work better and faster in building	E	0,42	0,001	Very small
	U	**0,03**	0,003	Very small

Table P-2.9. T-test results on gender equality for employees and service users

Appendix 2.5. Relative frequencies and average values of features and T-test results in chapter 2.3.2.

Feature	Sample	Stratum	Grade (%)					AV
			1	2	3	4	5	
I feel more comfortable in the building.	E	M	3,95	1,13	9,60	37,29	48,02	4,24
		F	2,37	1,58	8,30	36,36	51,38	4,33
	U	M	5,16	5,73	14,18	34,81	40,11	3,99
		F	4,31	3,68	13,94	36,50	41,57	4,07
My self-respect is higher / I am respected more by service provider.	E	M	3,37	5,06	23,60	43,82	24,16	3,80
		F	4,74	5,53	29,64	33,99	26,09	3,71
	U	M	8,31	11,03	28,51	33,38	18,77	3,43
		F	6,21	9,51	34,85	30,93	18,50	3,46
I memorize much better now.	E	M	3,37	7,30	35,39	39,33	14,61	3,54

		F	3,95	9,49	33,60	33,20	19,76	3,55
	U	M	14,18	15,47	34,38	26,36	9,60	3,02
		F	9,76	16,10	36,76	26,24	11,15	3,13
My concentration is better now.	E	M	2,81	6,18	22,47	46,07	22,47	3,79
		F	1,58	6,72	25,69	40,32	25,69	3,82
	U	M	9,89	9,74	28,65	35,96	15,76	3,38
		F	6,85	11,17	32,74	28,93	20,30	3,45

Table P-2.10. Overview of attitudes on gender in impact of MEE to mental health

Feature	Sample	*p*	**Size of impact**	
			Eta square	Size of difference between groups
I feel more comfortable in building.	E	0,34	0,002	Very small
	U	0,14	0,002	Very small
My self-respect increased / I am respected more by service provider.	E	0,36	0,002	Very small
	U	0,64	0,000	Exceptionally small
I am memorizing better now.	E	0,93	0,000	Exceptionally small
	U	0,06	0,002	Very small
My concentration is better now.	E	0,78	0,000	Exceptionally small
	U	0,26	0,001	Very small

Table P-2.11. T-test results on gender benefits from MEE for mental health

Appendix 2.6. Relative frequencies and average values of features and T-test results in chapter 2.3.3.

Feature	Sample	**Stratum**					**Grade (%)**
		1	2	3	4	5	
I feel more comfortable at workplace.	M	4,49	1,69	9,55	42,13	42,13	4,16
	F	0,79	1,19	6,72	44,27	47,04	4,36
Decreased difficulties in performance of tasks.	M	5,62	5,62	16,85	42,13	29,78	3,85
	F	1,98	3,16	19,37	43,48	32,02	4,00
I stay in the building longer than before.	M	8,99	9,55	36,52	33,71	11,24	3,29

	F	7,11	16,21	40,32	23,32	13,04	3,19
I am less absent from work.	M	10,67	10,67	32,02	28,65	17,98	3,33
	F	7,11	20,55	31,62	22,53	18,18	3,24
I am motivated to earn higher income.	M	6,74	4,49	24,72	43,26	20,79	3,67
	F	4,74	11,46	33,60	28,46	21,74	3,51
I feel more productive.	M	4,49	1,69	19,10	52,25	22,47	3,87
	F	2,78	5,56	26,98	38,89	25,79	3,79

Table P-2.12. Overview of gender equality attitudes for individual benefits of MEE for employees

Feature	Sample	*p*	**Size of impact**	
			Eta square	Size of difference between groups
I feel more comfortable at work.	E	**0,02**	0,012	More than small
Difficulties in performance of work duties decreased.	E	0,12	0,006	Very small
I stay longer in building than before.	E	0,36	0,002	Very small
I am absent less from work.	E	0,47	0,001	Very small
I am motivated to earn bigger income.	E	0,13	0,005	Very small
I feel more productive.	E	0,44	0,001	Very small

Table P-2.13. T-test results for gender equality in individual benefits from MEE for employees

Appendix 2.7. Relative frequencies and average values of features and T-test results in chapter 2.3.4.

Feature	Sample	**Stratum**					**Grade (%)**
		1	2	3	4	5	
I am more cooperative in work with colleagues.	M	3,37	1,69	21,91	49,44	23,60	3,88
	F	1,19	3,16	24,90	45,06	25,69	3,91
I am more motivated to participate in decision-making regarding my post.	M	5,62	6,74	24,16	46,63	16,85	3,62
	F	1,98	5,14	35,18	36,36	21,34	3,70
Social relations among employees are improved.	M	6,18	8,43	21,91	47,19	16,29	3,59
	F	3,17	10,32	36,51	33,73	16,27	3,50
Conflicts among employees decreased.	M	6,74	8,99	35,39	36,52	12,36	3,39
	F	4,74	13,04	43,08	26,48	12,65	3,29

Table P-2.14. Overview of attitudes on gender equality in impact of specific MEE to social cohesion of employees

Feature	Sample	*p*	Size of impact	
			Eta square	Size of difference between groups
I am more cooperative in work with colleagues.	E	0,75	0,000	Exceptionally small
I am more motivated to participate in decision-making regarding my post.	E	0,42	0,001	Very small
Social relations among employees are improved.	E	0,35	0,002	Very small
Conflicts among employees decreased.	E	0,34	0,002	Very small

Table P-2.15. T-tests results for gender equality in perception of social cohesion of employees at work

Appendix 2.8. Relative frequencies and average values of features and T-test results in chapter 2.3.5.

Feature	Sample	Stratum					Grade
		1	2	3	4	5	(%)
Quality of services provided by employees exceeds my expectations.	M	12,54	12,11	39,03	25,21	11,11	3,10
	F	9,75	14,30	37,97	26,58	11,39	3,16
Employees are kind while providing services.	M	9,83	10,40	36,75	28,77	14,25	3,27
	F	5,83	12,04	37,26	29,91	14,96	3,36
Employees are responsible while providing services.	M	7,98	6,13	30,06	33,76	22,08	3,56
	F	3,92	8,48	29,75	37,72	20,13	3,62

Table P-2.16. Overview of attitudes on gender equality in individual benefits from MEE for users

Feature	Sample	*p*	Size of impact	
			Eta square	Size of difference between groups
Quality of services provided by employees exceeds my expectations.	U	0,36	0,001	Very small
Employees are kind while providing services.	U	0,12	0,002	Very small
Employees are responsible while providing services.	U	0,30	0,001	Very small

Table P-2.17. T-test results for gender equality in perception of service users on performance of employees after implementation of MEE

Appendix 2.9. T-test results in chapter 2.3.6.

Feature	Sample	*p*	Size of impact	
			Eta square	Size of difference between groups
Satisfaction with ventilation in building – heating season	E	**0,02**	0,012	More than small
	U	**0,50**	0,003	Very small
Satisfaction with ventilation in building – inter season	E	0,25	0,003	Very small
	U	**0,01**	0,005	Very small
Satisfaction with ventilation in building – cooling season	E	0,28	0,003	Very small
	U	**0,00**	0,006	Very small

Table P-2.18. T-test results for gender equality in perception of satisfaction with ventilation in building, for employees and users

Feature	Sample	*p*	Size of impact	
			Eta square	Size of difference between groups
Satisfaction with lights in building – heating season	E	**0,03**	0,012	More than small
	U	0,66	0,000	Exceptionally small
Satisfaction with lights in building – inter season	E	**0,02**	0,012	More than small
	U	0,55	0,000	Exceptionally small
Satisfaction with lights in building – cooling season	E	**0,01**	0,015	More than small
	U	0,27	0,001	Very small

Table P-2.19. T-test results for gender equality in perception of satisfaction with lights in the building, for employees and users

APPENDIX 3

Appendix 3.1 – Questionnaire for institutions

QUESTIONNAIRE ON EFFECTS OF IMPLEMENTED ENERGY EFFICIENCY MEASURES IN PUBLIC BUILDINGS

This questionnaire is a part of the Study on human development benefits and gender mainstreaming through energy efficiency effects regarding the impact of energy efficiency measures in public buildings to human development and gender of employees and service users. The aim is to collect the data from this questionnaire to determine factual effects of implementation of energy efficiency measures in public buildings. All collected data pertaining to public institution or buildings shall not be presented as individual data, but shall only be used as a part of the cumulative data for the sample and for all public buildings where those measures have been implemented.

Questionnaire ref. _____

1. Name of Institution:

_____ .

2. What energy efficiency measures are implemented in the building?

_____

_____

_____

_____

3. Total value of investment into implemented energy efficiency measures:

_____

Situation before implementation of energy efficiency measures?

Average annual heating costs:	
Average annual electricity costs:	
Average annual current maintenance costs:	
Average annual costs of repairs in and on building:	
Average annual number of days of employee's absence from work:	
Average temperature in building during the heating season (15.10.-15.04):	
Average temperature in building during inter seasons (16.04.-14.06. and 16.09.-14.10)	
Average temperature in building during the cooling season (15.6.-15.09.)	
Quality of heating: (Specify one of the following: poor, insufficient, good, very good, excellent)	

5. Situation after implementation of energy efficiency measures?

Average annual heating costs:	
Average annual electricity costs:	
Average annual current maintenance costs:	
Average annual costs of repairs in and on building:	
Average annual number of days of employee's absence from work:	
No. of employees reallocated to other posts due to implementation of energy efficiency measures:	
No. of employees who lost the job due to implementation of energy efficiency measures:	
Average temperature in building during the heating season (15.10.-15.04)	
Average temperature in building during inter seasons (16.04.-14.06. and 16.09.-14.10)	
Average temperature in building during the cooling season (15.6.-15.09.)	
Quality of heating: (Specify one of the following: poor, insufficient, good, very good, excellent)	

6. Who initiated involvement of your institution into the energy reconstruction programme?

_____
_____
_____
_____ .

7. Who participated in planning of energy efficiency measures (e.g. insulation, boilers, joinery, etc.) in your institution (e.g. external stakeholders – ministries, non-governmental organisations, employees, clients, energy auditors, etc.)?

_____
_____
_____
_____ .

8. Who proposed energy efficiency measures that were implemented in your institution?

_____
_____ .

9. Who approved energy efficiency measures implemented in your institution?

_____
_____ .

10. Did you understand the selection criteria for institution where the energy efficiency measures would be implemented? If yes, specify criteria?

_____
_____
_____
_____
_____

11. How was your project included in implementation (e.g. call for bid, UNDP announcement, announcement by ministries, etc.)

_____
_____
_____
_____
_____ .

12. Were there any problems in project implementation? If yes, specify?

_____
_____

_____
_____ .

13. Were there any conflicts and appeals during the project implementation? (e.g. from other institutions, owners of nearby buildings or land, contractors, employees, service users, etc.) If yes, specify conflicts or appeals.

_____
_____
_____
_____.

14. Did you clearly understand the responsibility of all stakeholders in planning and project implementation process, as well as the use of project effects, per following phases (circle one answer per phase):

Phase	**Reply**	
Planning	Yes	No
Selection of specific project	Yes	No
Labour	Yes	No
Supervision of labour	Yes	No
Technical handover of building	Yes	No
Use of building	Yes	No

Appendix 3.2. Questionnaire for employees

QUESTIONNAIRE ON EFFECTS OF IMPLEMENTED ENERGY EFFICIENCY MEASURES IN PUBLIC BUILDINGS TO HUMAN DEVELOPMENT AND GENDER EQUALITY OF EMPLOYEES

The aim of data collection is to determine the opinion and attitude of employees on the impact of implemented energy efficiency measures in building to human health, living standard and behaviour as well as gender equality. This study is implemented in accordance with the code of anonymity of respondent's identity and confidentiality of collected data. Your individual responses shall not be presented as individual data, but only as a part of the cumulative data based on the replies of all respondents.

Name of Institution: _____
Questionnaire ref. _____

1. **Rank per importance, on the scale from 1 to 7, the impact of energy efficiency measures from the table to energy saving: 1 – the most important measure, 2 – second measure by importance, to 7 – the least important measure.**
2.

Measure	Rank
Warming up the building (insulation)	
Better-quality joinery (windows and doors)	
Use of energy efficient appliances	
Solar collector and photovoltaic cells	
Use of energy saving light bulbs	
Thermostats with programmable work regime	
Hydro insulation measures (prevention of water – rain leaking on roof, window, etc.)	

2. In your opinion, what is the average return period for investment in energy efficiency measures? (chose one answer):

a. to 3 years
b. 3-4 years
c. 5-6 years
d. 7-8 years
e. 8-9 years
f. 9 and more years

In questions 3 to 7 rank your agreement/disagreement with the following statements, by choosing the relevant number; the selected grades have the following meaning:

1 – I absolutely disagree
2 – I disagree
3 – I neither disagree nor agree
4 – I agree
5 – I absolutely agree

3. Please rank your agreement/disagreement with the statements on impact of implemented energy efficiency measure to human health and your health.

Statement	Grade				
General statement on impact of energy efficiency measures to human health					
Implementation of energy efficiency measures positively affects human health on a long-term run	1	2	3	4	5
Implementation of energy efficiency measures positively affects human age	1	2	3	4	5
Impact of energy efficiency measure in building to my physical health					
My health condition stabilized (e.g.: reduced headaches, difficulties with respiratory diseases, cardio-vascular diseases, rheumatic diseases, allergies etc.)	1	2	3	4	5
My work capacities increased	1	2	3	4	5
I am more active at work	1	2	3	4	5
I feel that I have more energy for performance of daily work duties	1	2	3	4	5
I am less tired when performing daily duties at work	1	2	3	4	5

I perform daily duties at work better and faster	1	2	3	4	5
Impact of energy efficiency measure in building to my mental health					
I feel more comfortable in the building	1	2	3	4	5
My self-confidence increased	1	2	3	4	5
I am memorizing better	1	2	3	4	5
My concentration improved	1	2	3	4	5

4. Please rank your agreement/disagreement with the statements on impact of implemented energy efficiency measure to your performance.

Statement	Grade				
Due to the adopted knowledge about energy efficiency projects I started buying energy efficient (saving) appliances.	1	2	3	4	5
Due to the adopted knowledge about energy efficiency projects I started following up more frequently the daily electricity tariff.	1	2	3	4	5
Due to the adopted knowledge about energy efficiency projects I started turning off more frequently the light bulbs and other appliances (computer, TV, radio and similar) when I am not in a room or when I do not use them.	1	2	3	4	5
If I had funds, I would participate in the projects of installation of energy efficiency insulation to the building where I live.	1	2	3	4	5
I take care of my energy consumption in daily life.	1	2	3	4	5

5. Please rank your agreement/disagreement with the statements about impact of implemented energy efficiency measure to living standard of people, micro environment of building and behaviour of employees in building.

Statement	Grade				
General statements about relation between energy efficiency and living standard					
Energy efficiency projects positively affect the economic growth and development.	1	2	3	4	5
Energy efficiency projects represent the potential for increase of income of citizens.	1	2	3	4	5
Energy efficiency projects decrease the energy costs in households and organisations.	1	2	3	4	5
Energy efficiency projects increase the living standard.	1	2	3	4	5
General statements about relation between energy efficiency and potential financial difficulties					
I expect increase in number of people who would lose the job in buildings where energy efficiency measures are implemented.	1	2	3	4	5
I expect that employees in building where energy efficiency measures are implemented would have more difficulties in their work.	1	2	3	4	5
General statements about impact of energy efficiency measures to micro environment of building (settlement where the building is located)					
Energy efficiency projects reduce the noise from building.	1	2	3	4	5
Energy efficiency projects reduce the emission of hazardous gases from building.	1	2	3	4	5
Buildings where the energy efficiency measures are implemented improve the aesthetic features of settlement where I live.	1	2	3	4	5
Impact of energy efficiency measures in building to performance of employees					
I feel more comfortable at work.	1	2	3	4	5
Difficulties in performance of work duties decreased.	1	2	3	4	5
I stay longer in building than before.	1	2	3	4	5

I am absent less from work.	1	2	3	4	5
I am motivated to earn bigger income.	1	2	3	4	5
I feel more productive.	1	2	3	4	5
Impact of energy efficiency measures to social cohesion of employees					
I am more cooperative in work with colleagues.	1	2	3	4	5
I am more motivated to participate in decision making related to my post.	1	2	3	4	5
Social relations among employees improved.	1	2	3	4	5
Conflicts among employees decreased.	1	2	3	4	5

6. Please rank your agreement/disagreement with the statements about gender in planning and implementation of energy efficiency measures and your participation in planning of specific project in this building.

Statement	Grade				
General statements about impact of energy efficiency measures to gender					
Men and women have equal opportunities to participate at energy efficiency trainings.	1	2	3	4	5
Men and women have equal opportunities to participate professionally in decision making related to energy efficiency.	1	2	3	4	5
In environments where women decide on energy consumption, savings in energy costs are higher.	1	2	3	4	5
Women play a crucial role in advocacy for and representation of energy use from renewable sources.	1	2	3	4	5
Women are more sensitive than men when it comes to understanding the impact of energy efficiency to environment.	1	2	3	4	5
Women are more sensitive than men when it comes to understanding the relation between energy consumption and climate changes.	1	2	3	4	5
Evaluation of your participation in planning and implementation of specific energy efficiency project in this building					
The decision makers consulted me when planning the energy efficiency measures.	1	2	3	4	5
I was informed during planning of energy efficiency measures.	1	2	3	4	5
The priorities proposed by female employees were taken into consideration when planning the energy efficiency measures in my organisation.	1	2	3	4	5
I was actively involved in implementation of energy efficiency measures in my organisation.	1	2	3	4	5
I was informed during implementation of energy efficiency measures in my organisation.	1	2	3	4	5
After implementation of energy efficiency measures, the work conditions in my organisation suited more to my needs.	1	2	3	4	5
Statements about further energy efficiency activities in specific building.					
I was informed about future energy efficiency projects in this building.	1	2	3	4	5
I was actively involved in planning of future energy efficiency projects in this building.	1	2	3	4	5
The priorities proposed by female employees were taken into consideration in future energy efficiency projects in this building.	1	2	3	4	5

7. Please rank your agreement/disagreement with the statements about impact of implemented energy efficiency measure to quality of services and satisfaction with physical features of building where service is provided for heating season, inter season and cooling season.

	Statement	Grades per seasons														
		HEATING SEASON (15.10.-15.04.)					INTER SEASON (16.04-14.06.; 16.09.-14.10.)					COOLING SEASON (15.06.-15.09.)				
Service features after implementation of energy efficiency measures in specific building																
Hospitals	Patients feel more comfortable in building.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	Bigger comfort for recovery of patients.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	Patients are less nervous.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	Decreased time of different medical services provision.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	Increased quality of services.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	Decreased number of patients' appeals.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Health centres	Bigger comfort for patient.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	Less nervousness in waiting rooms.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	Less appeals by patients.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	Patients feel more comfortable in building.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	Decreased time of provision of services.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	Increased quality of services.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Culture institutions	Users feel more comfortable in building.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	Bigger comfort for users.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	Decreased number of users' appeals.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	Increased quality of service.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Sport institutions	Users feel more comfortable in building.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	Bigger comfort for users.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	Decreased number of users' appeals.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	Increased quality of service.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	Improved health of users.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Public administration	Less nervousness at admission points/window tellers.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	Less appeals by citizens to the work of employees.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	Citizens feel comfortable in building.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	Bigger comfort for citizens.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5

	Decreased time of service provision.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	Increased quality of services.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Schools for children with special needs	Students feel more comfortable while staying in school.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	Improved quality of lessons.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	Students are more active at lessons.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	Students achieve better results.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	Improved health of students which results with decrease of absences in general.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	Better use of all school premises.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Schools and faculties	Students feel more comfortable while staying in school.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	Improved quality of lessons.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	Students are more active at lessons.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	Students achieve better results.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	Improved health of students which results with decrease of absences in general.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	Better use of all school/faculty premises.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
All-day accommodation & nursing centres	Users feel more comfortable in building.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	Bigger comfort for users.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	Decreased number of users' appeals.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	Better socializing between the users.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	Increased quality of service.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	Improved health of users.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Kindergartens	In winter period, children are less absent from kindergarten.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	Children feel more comfortable while staying in kindergarten.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	Children are more active.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	Due to implemented	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5

	energy efficiency measures parents are more satisfied.															
	Improved health of children which results with decrease of absences in general.	**1**	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**
	Better use of all premises in kindergarten.	**1**	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**
	Improved quality of educational process.	**1**	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**
Satisfaction with physical features of workplace after implementation of energy efficiency measures in specific building																
I am satisfied with average air temperature in building.		**1**	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**
I am satisfied with ventilation in building.		**1**	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**
I am satisfied with lights in building.		**1**	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**
I am satisfied with air quality in building.		**1**	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**
I am satisfied with air humidity in building.		**1**	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**
I am satisfied with sound insulation in building.		**1**	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**
I am satisfied with energy consumption in building.		**1**	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**
I am satisfied with energy costs in building.		**1**	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**

8. Socio-demographic features of respondents:

8.1. Chose gender of respondent:

a) Male
b) Female

8.2. Post of respondent (chose one answer):

a) Management (director, deputy director, etc.)
b) Medical staff (doctors and medical technicians)
c) Administration staff
d) Technical staff
e) Other:_____

8.3. Highest professional /educational degree of respondent (chose one answer):

a) primary school degree
b) high school degree
c) university degree
d) associate degree
e) Master of Sciences/Arts
f) Doctor of Sciences/ Arts

8.4. Age of respondent: _____

8.5. Number of household members:_____

8.6. Average monthly income of your household (all employed members) (chose one answer):

a) to 1.000 KM

b) 1.001-1.500 KM

c) 1.501-2.000 KM

d) 2.001-2.500 KM

e) over 2.500 KM

8.7. Total employment record (in years): _____

8.8. Employment record in the building (in years): _____

8.9. Average daily time (in hours) you spend in the building: ____

8.10. Building where you mainly live (chose one answer)

a) house

b) apartment

8.11. Place of respondent's residence (circle one answer)

a) urban

b) suburban

c) rural

Appendix 3.3. Questionnaire for users

QUESTIONNAIRE ON EFFECTS OF IMPLEMENTED ENERGY EFFICIENCY MEASURES IN PUBLIC BUILDINGS TO HUMAN DEVELOPMENT AND GENDER EQUALITY OF SERVICE USERS

The aim of data collection is to determine the opinion and attitude of public building service users on the impact of implemented energy efficiency measures in building to human health, living standard and behaviour as well as gender. This study is implemented in accordance with the code of anonymity of respondent's identity and confidentiality of collected data. Your individual responses shall not be presented as individual data, but only as a part of the cumulative data based on the replies of all respondents.

Name of Institution: _____

Questionnaire ref. _____

1. Rank per importance, on the scale from 1 to 7, the impact of energy efficiency measures from the table to energy saving: 1 – the most important measure, 2 – second measure by importance, to 7 – the least important measure.

Measure	Rank
Warming up the building (insulation)	
Better-quality joinery (windows and doors)	
Use of energy efficient appliances	
Solar collector and photovoltaic cells	
Use of energy saving light bulbs	
Thermostats with programmable work regime	
Hydro insulation measures (prevention of water – rain leaking on roof, window, etc.)	

2. In your opinion, what is the average return period for investment in energy efficiency measures? (chose one answer):

a. to 3 years
b. 3-4 years
c. 5-6 years
d. 7-8 years
e. 8-9 years
f. 9 and more years

3. Please specify the average number of days you spend a year in the building. Specify the number of days ____ .

In questions 4 to 8 rank your agreement/disagreement with the following statements on the scale 1 to 5, by choosing the relevant number; the selected grades have the following meaning:

1 – I absolutely disagree
2 – I disagree
3 – I neither disagree nor agree
4 – I agree
5 – I absolutely agree

4. Please rank your agreement/disagreement with the statements about impact of implemented energy efficiency measure to human health and your health.

Statement	Grade				
General statement on impact of energy efficiency measures to human health					
Implementation of energy efficiency measures positively affects human health on a long-term run	1	2	3	4	5
Implementation of energy efficiency measures positively affects human age	1	2	3	4	5
Impact of energy efficiency measure in building to my physical health					
My health condition stabilized (e.g.: reduced headaches, difficulties with respiratory diseases, cardio-vascular diseases, rheumatic diseases, allergies etc.)	1	2	3	4	5
My work capacities increased	1	2	3	4	5
I am more active at work	1	2	3	4	5

I feel that I have more energy for performance of daily work duties	1	2	3	4	5
I am less tired when performing daily duties at work	1	2	3	4	5
I perform daily duties at work better and faster	1	2	3	4	5
Impact of energy efficiency measure in building to my mental health					
I feel more comfortable in the building	1	2	3	4	5
My self-confidence increased	1	2	3	4	5
I am memorizing better	1	2	3	4	5
My concentration improved	1	2	3	4	5

5. Please rank your agreement/disagreement with the statements about impact of implemented energy efficiency measure to your performance.

Statement	**Grade**				
Due to the adopted knowledge about energy efficiency projects I started buying energy efficient (saving) appliances.	1	2	3	4	5
Due to the adopted knowledge about energy efficiency projects I started following up more frequently the daily electricity tariff.	1	2	3	4	5
Due to the adopted knowledge about energy efficiency projects I started turning off more frequently the light bulbs and other appliances (computer, TV, radio and similar) when I am not in a room or when I do not use them.	1	2	3	4	5
If I had funds, I would participate in the projects of installation of energy efficiency insulation to the building where I live.	1	2	3	4	5
I take care of my energy consumption in daily life.	1	2	3	4	5

6. Please rank your agreement/disagreement with the statements about impact of implemented energy efficiency measure to living standard of people, micro environment of building and performance of employees in building.

Statement	**Grade**				
General statements about relation between energy efficiency and living standard					
Energy efficiency projects positively affect the economic growth and development.	1	2	3	4	5
Energy efficiency projects represent the potential for increase of income of citizens.	1	2	3	4	5
Energy efficiency projects decrease the energy costs in households and organisations.	1	2	3	4	5
Energy efficiency projects increase the living standard.	1	2	3	4	5
General statements about relation between energy efficiency and potential financial difficulties					
I expect increase in number of people who would lose the job in buildings where energy efficiency measures are implemented.	1	2	3	4	5
I expect that employees in building where energy efficiency measures are implemented would have more difficulties in their work.	1	2	3	4	5
General statements about impact of energy efficiency measures to micro environment of building (settlement where the building is located)					
Energy efficiency projects reduce the noise from building.	1	2	3	4	5
Energy efficiency projects reduce the emission of hazardous gases from building.	1	2	3	4	5
Buildings where the energy efficiency measures are implemented improve the aesthetic features of settlement where I live.	1	2	3	4	5
Impact of energy efficiency measures in building to performance of employees					

Quality of services provided by employees exceed my expectations	1	2	3	4	5
Employees are kind when providing services	1	2	3	4	5
Employees are responsible when providing services	1	2	3	4	5

7. Please rank your agreement/disagreement with the statements about gender in planning and implementation of energy efficiency measures and your participation in planning of specific project in this building.

Statement	Grade				
General statements about impact of energy efficiency measures to gender					
Men and women have equal opportunities to participate at energy efficiency trainings.	1	2	3	4	5
Men and women have equal opportunities to participate professionally in decision making related to energy efficiency.	1	2	3	4	5
In environments where women decide on energy consumption, savings in energy costs are higher.	1	2	3	4	5
Women play a crucial role in advocacy for and representation of energy use from renewable sources.	1	2	3	4	5
Women are more sensitive than men when it comes to understanding the impact of energy efficiency to environment.	1	2	3	4	5
Women are more sensitive than men when it comes to understanding the relation between energy consumption and climate changes.	1	2	3	4	5
Evaluation of service users' participation in planning and implementation of specific energy efficiency project and further activities					
Evaluation of your participation in planning of specific energy efficiency project in this building					
The decision makers consulted me when planning the energy efficiency measures.	1	2	3	4	5
I was informed during planning of energy efficiency measures.	1	2	3	4	5
I was actively involved in implementation of energy efficiency measures in my organisation.	1	2	3	4	5
I was informed during implementation of energy efficiency measures in my organisation.	1	2	3	4	5
Statements about further energy efficiency activities in specific building.					
I was informed about future energy efficiency projects in this building.	1	2	3	4	5
I was actively involved in planning of future energy efficiency projects in this building.	1	2	3	4	5

8. Please rank your agreement/disagreement with the statements about impact of implemented energy efficiency measure to quality of services and satisfaction with physical features of building where service is provided for heating season, inter season and cooling season.

	Statement	Grade per seasons														
		HEATING SEASON (15.10.-15.04.)					INTER SEASON (16.04-14.06.; 16.09.-14.10.)					COOLING SEASON (15.06.-15.09.)				
Service features after implementation of energy efficiency measures in specific building																
Schools and faculties	Students feel more comfortable while staying in school.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5

	Improved quality of lessons.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	Students are more active at lessons.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	Students achieve better results.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	Improved health of students which results with decrease of absences in general.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	Better use of all school/faculty premises.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Hospitals	Patients feel more comfortable in building.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	Bigger comfort for recovery of patients.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	Patients are less nervous.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	Decreased time of different medical services provision.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	Increased quality of services.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	Decreased number of patients' appeals.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Health centres	Bigger comfort for patient.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	Less nervousness in waiting rooms.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	Less appeals by patients.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	Patients feel more comfortable in building.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	Decreased time of provision of services.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	Increased quality of services.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Culture institutions	Users feel more comfortable in building.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	Bigger comfort for users.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	Decreased number of users' appeals.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	Increased quality of service.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Sport institutions	Users feel more comfortable in building.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	Bigger comfort for users.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	Decreased number of users' appeals.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	Increased quality of service.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	Improved health of users.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Public administration	Less nervousness at admission points/window tellers.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	Less appeals by citizens to the work of employees.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	Citizens feel comfortable in building.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	Bigger comfort for citizens.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	Decreased time of service provision.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5

	Increased quality of services.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Schools for children with special needs	Students feel more comfortable while staying in school.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	Improved quality of lessons.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	Students are more active at lessons.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	Students achieve better results.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	Improved health of students which results with decrease of absences in general.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	Better use of all school premises.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
All-day accommodation & nursing centres	Users feel more comfortable in building.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	Bigger comfort for users.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	Decreased number of users' appeals.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	Better socializing between the users.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	Increased quality of service.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	Improved health of users.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Kindergartens	In winter period, children are less absent from kindergarten.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	Children feel more comfortable while staying in kindergarten.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	Children are more active.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	Due to implemented energy efficiency measures parents are more satisfied.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	Improved health of children which results with decrease of absences in general.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	Better use of all premises in kindergarten.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	Improved quality of educational process.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Satisfaction with physical features of premises after implementation of energy efficiency measures in specific building																
I am satisfied with average air temperature in building.		1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
I am satisfied with ventilation in building.		1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
I am satisfied with lights in building.		1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
I am satisfied with air quality in building.		1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
I am satisfied with air humidity in building.		1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
I am satisfied with sound insulation in building.		1	2	3	4	5	1	2	3	4	5	1	2	3	4	5

9. Socio-demographic features of respondents:

9.1. Chose gender of respondent:

a) Male
b) Female

9.2. Highest professional /educational degree of respondent (chose one answer):

a) primary school degree
b) high school degree
c) university degree
d) associate degree
e) Master of Sciences/Arts
f) Doctor of Sciences/ Arts

9.3. Age of respondent: _____

9.4. Number of household members:_____

9.5. Average monthly income of your household (all employed members) (chose one answer):

a) to 1.000 KM
b) 1.001-1.500 KM
c) 1.501-2.000 KM
d) 2.001-2.500 KM
e) over 2.500 KM

9.6. Building where you mainly live (chose one answer)

a) house
b) apartment

9.7. Place of respondent's residence (chose one answer)

a) urban
b) suburban
c) rural