

# ENERGY EFFICIENCY IN POLAND 2012 REVIEW



## BUILDINGS



**CEM** ABOUT POLES'  
ATTITUDES TOWARDS  
ENERGY SAVING

**PIOTR PAWLAK,**  
**MAREK ZABOROWSKI**  
ABOUT ENERGY  
PERFORMANCE OF  
BUILDINGS

**IEE** ABOUT THE  
EXEMPLARY ROLE OF  
LOCAL GOVERNMENT  
IN ENERGY EFFICIENCY

**JAN RĄCZKA**  
ABOUT THE COST  
EFFECTIVENESS INDEX

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ABOUT A NEW ENERGY  
PLANNING MODEL

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# INTRODUCTION

MAREK ZABOROWSKI

We are convinced that we are participating in an energy revolution. Revolutions usually result from the necessity of changes and the impossibility of maintaining the status quo. There are numerous drivers behind the current changes in the Polish energy sector. The two main factors are:

- a) The emergence of new technological possibilities that completely alter the paradigm for the functioning and development of the energy sector (introduction of ICT solutions, microgeneration, cheaper RES installations). Thanks to new generation methods and ICT technologies, passive energy consumers can become active prosumers – controlling their energy consumption and participating in the energy market;
- b) The pressure exerted by EU legislation, which makes the obligations of the member states increasingly demanding (nearly zero energy buildings, exemplary role of public institutions, energy management, etc.) and tightens the standards for the technical parameters of equipment and buildings.

Is Poland preparing itself for this revolution? Will it be possible to mobilise Polish society so that it supports these inevitable changes and actively participates in them? This review makes an attempt at answering these and other questions. We have conducted research to get a picture of the current state of social awareness in the area of energy efficiency, analysed expectations towards local authorities and their exemplary role and verified whether any conclusions can be drawn from aggregated data collected during the preparation of energy performance certificates. All this forms an interesting picture – despite

the declarations of various politicians, little is happening in the Polish energy efficiency sector. However, changes enforced by EU legislation are becoming more and more visible in the construction sector.

The review also includes several articles focusing on selected issues. Janusz Mazur, the President of the Energy Saving Company ESCO, evaluates the development of the ESCO market. Jan Rączka, the former President of the Board of the National Fund for Environmental Protection and Water Management, shares his reflections upon result indicators – the Fund has made an effort to measure the effects of its programmes. Arkadiusz Węglarz talks about the necessity of changes in energy planning.

We have devoted special attention to the measures taken by the National Fund for Environmental Protection and Water Management, as in the last several years this institution has been particularly involved in energy efficiency improvement in Poland.

We hope that the review proves to be an important publication, especially in the context of the new financial perspective, bearing in mind that the European Commission attaches considerable significance to energy efficiency issues.

The team of the Institute of Environmental Economics

# REPORT ON NEWLY CONSTRUCTED BUILDINGS IN POLAND (ERECTED IN 2010–2012) SINGLE-FAMILY AND MULTI-FAMILY BUILDINGS

PIOTR PAWLAK  
MAREK ZABOROWSKI

PIOTR PAWLAK, M.Sc. Eng.

Build Desk Polska, ROCKWOOL Poland – graduate of the Łódź University of Technology, the Faculty of Civil Engineering and the Faculty of Organisation and Management. Has been working on the insulation materials market for over 15 years, actively promoting energy efficiency in the construction sector. Currently works as the manager of the Energy Design Centre – a new department of ROCKWOOL Poland, which provides consultancy services and assistance in upgrading building designs to high energy efficiency standards, taking into account financial viability issues. Has participated in numerous conferences, seminars and symposia on energy efficiency in the construction sector. President of BuildDesk – a consultancy company providing services in energy efficiency and building optimisation. Creator of the BuildDesk system – a support tool for energy auditors, designers and consultants.

This analysis utilises a database of technical information on certified buildings, which has been collected by means of the BuildDesk system. It includes data on the buildings' construction structure, elements and systems. As a result, the statistical analyses are based on actual numerical data referring to the technical characteristics of the buildings. The system has been gathering this information for four years now, so it allows an initial analysis of trends in the Polish construction sector.

The data collected in the BuildDesk system come from over 60,000 buildings constructed in Poland (new, rendered for use, sold, modernised, etc.). Due to the extensive data volume it was possible to obtain objective, statistically verified information. The buildings which are analysed here were certified between 1 January 2009 and 31 December 2012.

The system allows for selective analysis, both by dividing the country into counties (*powiat*) and voivodships (*województwo*), as well as for the whole area of Poland. Due to the provisions of the Act on Protection of Personal Data, although statistical analyses can be conducted, it is impossible to identify the exact location of buildings.

Based on the administrative division into counties and voivodships, the system classifies the data (by means of postal codes) and then performs the necessary calculations. Basic technical information is derived from energy performance certificates. As a system of obligatory certification has not been effectively implemented on the resale market, the data refer mainly to new buildings (existing buildings that are sold, rented or extended account for only 20% of certified buildings). Given that the Directive on the energy performance of buildings clearly defines an obligation to certify buildings on the primary as well as the resale market, this lack of certification at the resale market should be seen as a failure in implementing the directive in Poland. Lack of reliable information about buildings at the resale market impedes effective state policy in this area.

## MAIN CONCLUSIONS

Based on the information acquired from the BuildDesk database, containing data from around 60,000 buildings certified in the period 2009–2012, we can conclude the following.

1. The insulation of buildings is systematically improving, thereby reducing their energy intensity.
2. Cautiousness does not allow an unequivocal opinion on utilisation of renewable energy sources (RES). The information acquired shows that biomass constitutes the main source of renewable energy. However, the declared utilisation of biomass for heating most probably results from the fact that energy certifiers want to achieve the best  $E_p$  parameter – it should not be regarded as a “biomass revolution” in the Polish construction sector.
3. A worrying trend for substituting gas heating (a relatively clean solution) with coal heating has been observed in single-family buildings. This is highly detrimental not only due to increased greenhouse gas (GHG) emissions but also due to the negative impact of coal combustion on air quality in urbanised areas (e.g. Krakow, Zakopane). The replacement of comfortable gas heating with much less convenient coal

### MAREK ZABOROWSKI, M.Sc. Eng.

Vice President of the Institute of Environmental Economics, expert in energy efficiency. Graduated from the Faculty of Chemical Engineering and Technology at the Krakow University of Technology and postgraduate studies in environmental economics at the University of Minnesota. Active in the energy efficiency field for over 15 years. A consultant to numerous state and international institutions and companies, e.g. the European Commission, OECD, ARUP, ECO RYS, Scott-Willson. In 2000–2009 a member of the Board and the President of the Małopolska Energy and Environment Agency. In 2005–2007 a member of the Board of Trustees at the National Fund for Environmental Protection and Water Management.



heating proves that coal is extremely competitively priced. As far as CO<sub>2</sub> emissions are concerned, coal heating reduces the positive effect obtained by better insulation of the building fabric.

4. District heating is used more and more frequently in multi-family buildings, which is a highly positive trend.
5. The availability of funding has a clear impact on the application of supported technologies. Utilisation of solar collectors for hot domestic water, promoted by the National Fund for Environmental Protection and Water Management, is gaining increasing popularity. On the other hand, heat pumps, which have not been supported for many years, are very rarely chosen. According to the authors the latter is justified as:
  - a) an increase in electricity demand is not recommended (Poland already lacks generation capacity and problems with power supply are going to aggravate);
  - b) 95% of electricity is still generated in Poland from coal, therefore, the benefit of reduced CO<sub>2</sub> emissions due to installation of a heat pump is partly or totally offset by the consumption of coal-based power; c) heat pumps constitute an expensive solution.



# RECOMMENDATIONS FOR 2013 AND FUTURE YEARS

Based on this analysis we propose the following recommendations.

1. Promotion of energy-efficient technologies – the reduction of energy demand provides an effective solution for decreasing emissions of carbon dioxide and other pollutants, regardless of the fuel.
2. Focusing media activities on the remaining technologies – not only insulation, which is already relatively popular.
3. Explanation of the growth in the popularity of biomass – Polish government should immediately introduce remedial measures aimed at a real increase in RES use for heating.
4. Possible introduction of a ban on solid fuels (biomass and coal) in new buildings within the areas with air quality problems – in particular when district heating and gas networks are available.

## DEFINITIONS\*

**SINGLE-FAMILY BUILDING** – a detached, semi-detached, terraced or grouped building, constructed to satisfy residential needs, constituting an independent entity from the constructional perspective and representing one residential unit.

**MULTI-FAMILY BUILDING** – a building with more than one residential unit as well as hotels and similar buildings.

**RESIDENTIAL UNIT** – a complex of residential and auxiliary quarters, with a separate entrance, separated with

\* Regulation of the Minister of Infrastructure of 6 November 2008 on the methodology for the calculation of energy performance of buildings and residential units or parts of buildings constituting a technically and functionally independent unit and on the manner of preparation of energy performance certificates and their models, *Dziennik Ustaw (Polish Journal of Laws)* No 201, item 1240

permanent space divisions, fulfilling the conditions for permanent residence and an independent household.

**PART OF A BUILDING CONSTITUTING AN INDEPENDENT TECHNICAL AND FUNCTIONAL ENTITY** – part of a building with the same function, where construction and installation solutions allow for its independent functioning in line with its purpose and intended use.

**USABLE ENERGY (EU)** – takes into account heat losses through the building fabric, energy necessary for heating water, energy used for ventilation and air conditioning.

**FINAL ENERGY (EF)** – the value for usable energy increased by the losses resulting from the efficiency of systems for heating rooms and water.

**PRIMARY ENERGY (EP)** – final energy multiplied by a relevant primary resource factor characteristic for each final energy carrier; the factor defines the conventional impact of a particular energy source on CO<sub>2</sub> emissions.

Table 1. Primary resource factors ( $W_p$ ) for generation and supply of energy or an energy carrier to a building.

No		Final energy carrier	PRF ( $W_p$ )
1		Fuel oil	1.1
2		Natural gas	1.1
3		Liquefied petroleum gas	1.1
4	Fuel/energy source	Hard coal	1.1
5		Lignite	1.1
6		Biomass	0.2
7		Thermal solar collector	0
8	Heat from combined generation <sup>1</sup>	Hard coal, natural gas <sup>3</sup>	0.8
9		Renewable energy (biogas, biomass)	0.15
10	Local heating systems	Heat from a coal thermal power station	1.3
11		Heat from a gas/oil thermal power station	1.2
12		Heat from a biomass thermal power station	0.2
13	Electricity	Mixed generation <sup>2</sup>	3.0
14		PV systems <sup>4</sup>	0.7

<sup>1</sup> combined heat and electricity generation

<sup>2</sup> refers to supply from a utility power grid

<sup>3</sup> if there is no information on energy parameters of district heating from a CHP plant, the primary resource factor is defined at 1.2.

<sup>4</sup> Photovoltaic cells (generation of electricity from solar energy)

Note: for thermal solar collectors the PRF is 0.0.

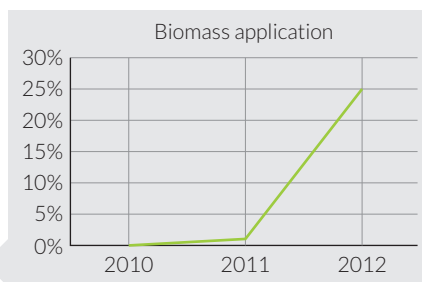
# ENERGY EFFICIENT TECHNOLOGIES IN SINGLE FAMILY BUILDINGS

The data provided below are derived from *circa* 40,000 energy performance certificates issued by BuildDesk in 2010–2012 for single-family buildings (data for 2009 are not included). The table below presents energy efficiency technologies applied in single-family buildings, according to the frequency of their employment in 2012.

Table 2. List of energy efficient technologies applied in single family buildings.

	2010	2011	2012
Biomass	0,1%	1,0%	24,9%
Very good thermal insulation	2,3%	12,9%	15,5%
Triple glazed windows	7,0%	9,3%	9,4%
Solar collectors for hot domestic water	0,1%	0,2%	4,0%
Heat recuperation from ventilation	2,9%	3,5%	3,4%
Glycol-water heat pumps	1,0%	1,0%	0,8%
Solar collectors for central heating	0,0%	0,0%	0,3%
Air-water heat pumps	0,2%	0,1%	0,2%

Biomass (24.9%) – the data shows that biomass is applied for heating in nearly 25% of single-family buildings. The increase in the popularity of this energy resource has been sudden – nothing similar has been observed for any other technology. Rather than reflecting real interest in biomass, this phenomenon results from the fact that by declaring its application (e.g. in a fireplace) one may significantly improve the building's energy performance.



Graph 1

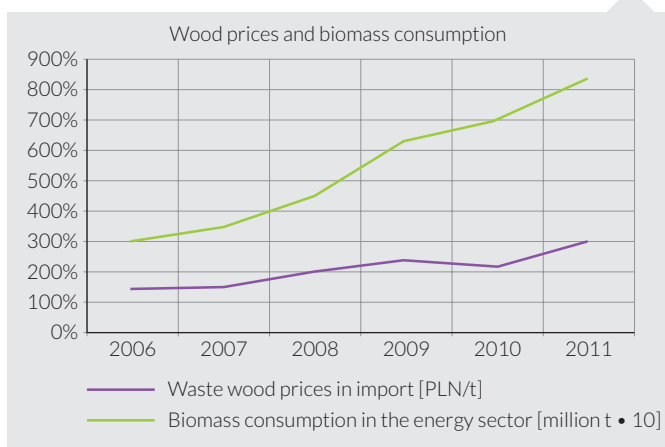
This situation leads to certain risks:

1. Biomass will be used rarely, with coal and other fossil fuels replacing it (in extreme cases it may not be utilised at all). The fact that households prefer coal to biomass results or

will result from the growing price of this resource, which depends on the global demand for biomass. This demand is increasing due to the obligation imposed on energy companies to utilise renewable energy sources. The easiest solution in this respect is to co-combust biomass in power plants.

If fossil fuels are used for heating, the actual consumption of primary energy will be much higher than the  $E_p$  specified in the energy performance certificate.

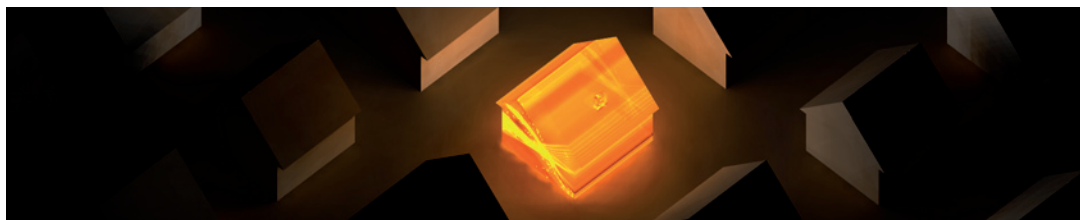
Graph 2



2. The use of fireplaces and boilers for solid fuels, in particular during autumn and in densely populated areas, constitutes a considerable problem that will be extremely difficult to solve\*. The replacement of an already existing solid fuel boiler is expensive and technically complicated and at times, therefore, even impossible.

\* Marek Zaborowski, the co-author of this report, has seen old, varnished furniture burnt in a fireplace located in the dining room of a bed and breakfast in Zakopane (one of the Polish mountain resorts). Thick, yellow smoke was released into the atmosphere at the first-floor level.

Declared biomass combustion, which is introduced to obtain a legally required  $E_p$  value and to prove GHG emission reduction, may in practical terms increase atmospheric pollutant emissions at the local level. The issue is even more complex, as a ban on biomass and coal combustion for individual heating may be introduced in cities and towns with considerable air quality problems\*.



Very good thermal insulation (15.5%) – the category of “buildings with better insulation” includes buildings where the value of the heat transfer coefficient for the building fabric was lower than 0.18 (the average for the whole surface). This should be regarded as a success – investors and designers are beginning to understand that going beyond norms may be profitable.

HDW solar collectors (4%) – heating hot domestic water with solar collectors is gaining popularity. To a large extent this results from the programme of the National Fund for Environmental Protection and Water Management, subsidizing 45% of such installations.

\* Krakow's Mayor, Jacek Majchrowski, has asked the Marshal of Małopolska (regional authority) to introduce a solid fuel ban in the city. (Gazeta Wyborcza, 18 January 2013, [http://krakow.gazeta.pl/krakow/1,44425,13259646,Prezydent\\_Krakowa\\_popiera\\_zakaz\\_palenia\\_weglem\\_w\\_miescie.html#ixzz2J6k2Lgtf](http://krakow.gazeta.pl/krakow/1,44425,13259646,Prezydent_Krakowa_popiera_zakaz_palenia_weglem_w_miescie.html#ixzz2J6k2Lgtf))

## ENERGY PERFORMANCE OF BUILDINGS

### SINGLE-FAMILY BUILDINGS

Except for 2009, a similar amount of energy performance certificates was issued each year for single-family buildings (around 11,500 certificates annually).

Table 3. Energy consumption indexes for single-family buildings in 2010–2012

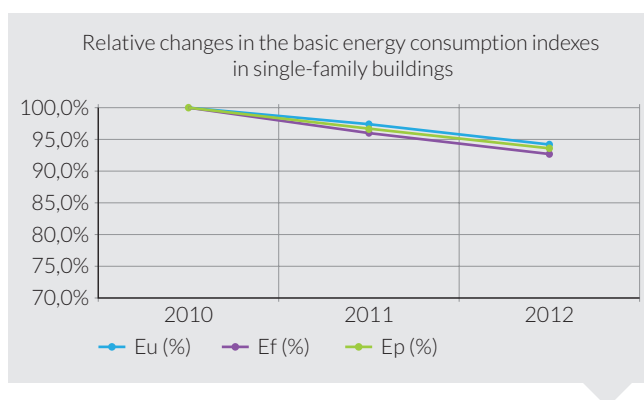
	2009	2010	2011	2012
Eu	<b>109,03</b>	107,05	104,3	100,83
Ef	<b>143,16</b>	139,9	134,33	129,68
Ep	<b>138,92</b>	133,79	129,42	125,27
N	<b>14 140</b>	11 709	11 116	11 400

The following table presents relative changes in the energy consumption indexes, compared with 2010 as the reference year.

Table 4. Relative changes in the average energy consumption indexes in 2010–2012 in single-family buildings

	2010	2011	2012
Eu (%)	100,0%	97,4%	94,2%
Ef (%)	100,0%	96,0%	92,7%
Ep (%)	100,0%	96,7%	93,6%

Graph 3



All the indexes decrease systematically by 3% a year.

## MULTI-FAMILY BUILDINGS

Since 2009 around 300 energy performance certificates have been issued annually for multi-family buildings.

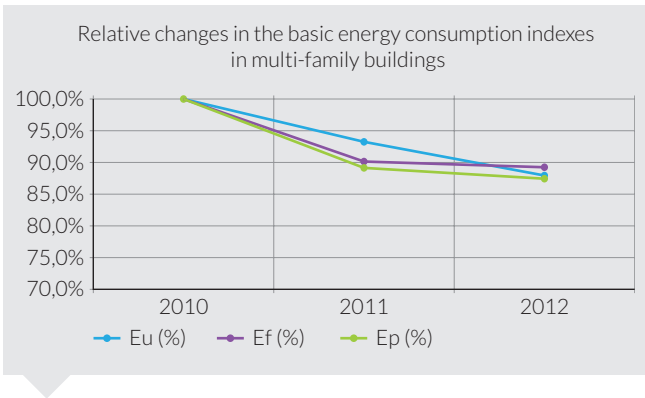
Table 5. Energy consumption indexes for multi-family buildings in 2010–2012

	2009	2010	2011	2012
Eu	<b>101,06</b>	97,09	90,47	85,39
Ef	<b>125,78</b>	121,48	109,44	108,38
Ep	<b>137,98</b>	127,44	113,52	111,39
N	<b>291</b>	302	322	288

The following table presents relative changes in the energy consumption indexes, compared with 2010 as the reference year.

Table 6. Relative changes in the average energy consumption indexes in 2010–2012 in multi-family buildings

	2010	2011	2012
Eu (%)	100,0%	93,2%	87,9%
Ef (%)	100,0%	90,1%	98,2%
Ep (%)	100,0%	89,1%	87,4%



Graph 4

Average changes in 2010–2012 are twice as high as for single-family buildings and amount to 6% a year – the most significant increase, around 10%, occurred in 2011. The highest changes were observed for final energy and primary energy.

## COMPARISON OF ENERGY PARAMETERS: Ef/Ep

Table 7. Comparison of energy parameters: Ef/Ep

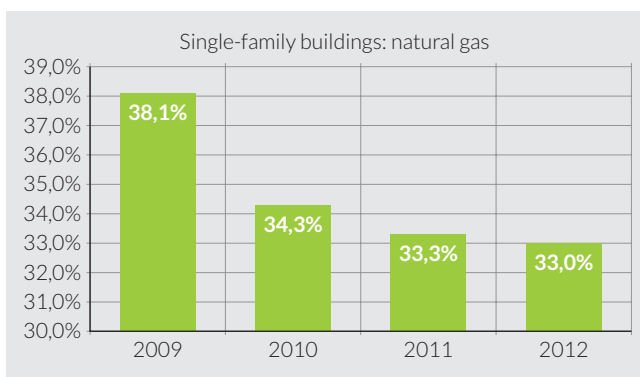
	2010	2011	2012
Single-family buildings	0,96	0,96	0,97
Multi-family buildings	1,05	1,04	1,03

In single-family buildings the ratio between final energy and primary energy values is higher than 1 (as  $E_p = E_f \cdot w$ , therefore,  $E_p/E_f$  marks the value of the  $w$  coefficient). In single-family buildings, a value lower than 1 may result from declaring that biomass is used for heating. In multi-family buildings, the relatively low value of the coefficient results from the application of district heating.



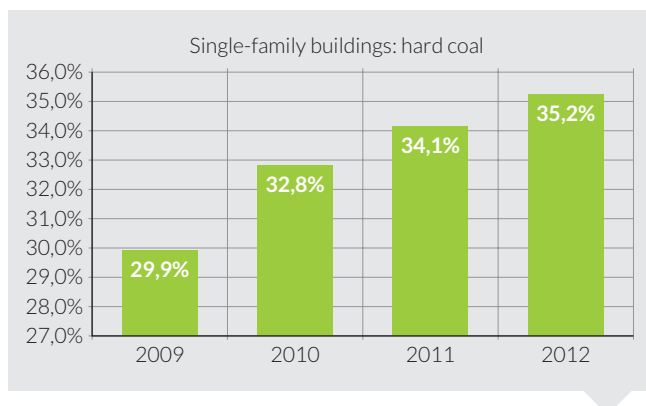
## FUEL CONSUMPTION FUEL CONSUMPTION IN SINGLE-FAMILY BUILDINGS

Graph 5



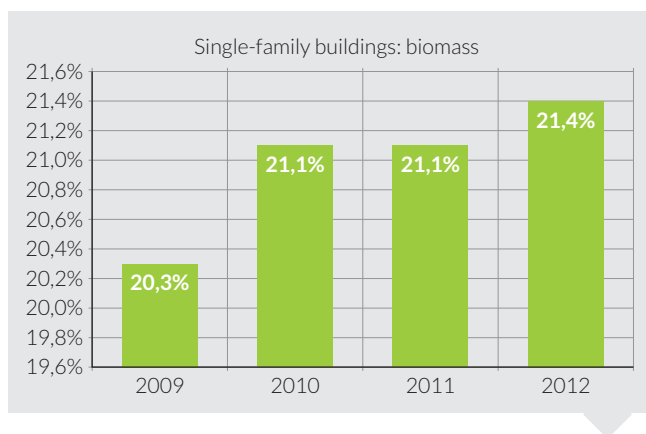
The relative share of final energy from gas is systematically declining – since 2009 it has decreased by around 5%. A similar trend is occurring in the use of fuel oil and liquefied petroleum gas.





Graph 6

The relative share of final energy from coal is systematically growing – since 2009 it has increased by around 5%. The above data can be interpreted directly – coal is superseding gas slowly albeit systematically as a source of energy in single-family buildings. This results first and foremost from the high price competitiveness of coal (both hard coal and lignite are sold). Heating with electricity is also increasing its share.

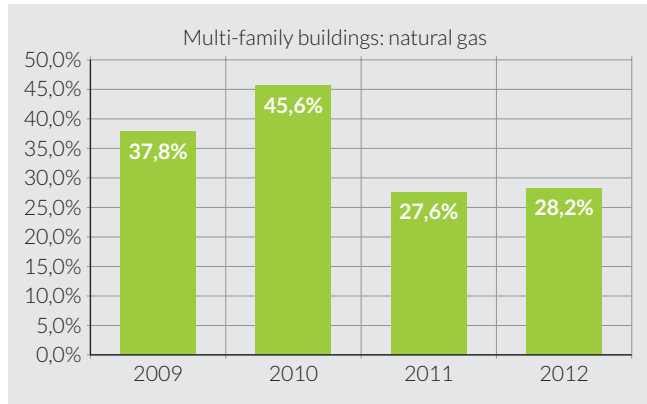


Graph 7

Although the share of biomass is relatively small, it keeps increasing.

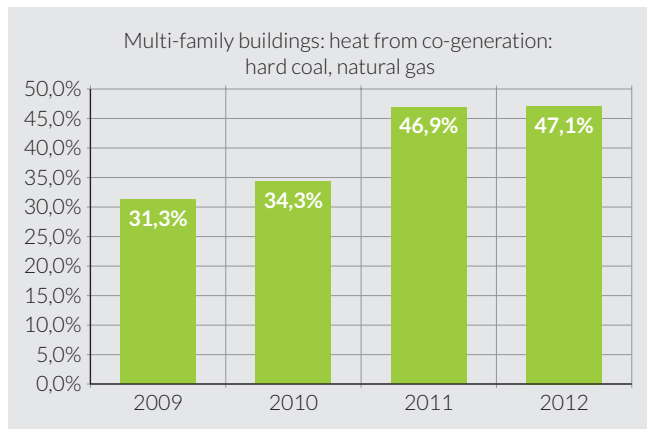
## MULTI-FAMILY BUILDINGS

Graph 8



Similar to single-family buildings, the share of natural gas for heating multi-family buildings is systematically declining.

Graph 9



The increase in the share of co-generation among certified buildings is considerable (16% in 2009–2012).

# ENERGY SAVING IN THE OPINION OF THE POLES – REPORT FROM RESEARCH

ŁUKASZ PYTLIŃSKI  
ANALYSIS OF RESULTS

## INFORMATION ABOUT THE RESEARCH

### RESEARCH DATE

The research was conducted by the CEM Market and Public Opinion Research Institute and the Institute of Environmental Economics on 3–12 January 2013.

### RESEARCH METHODOLOGY

The research was conducted by means of the CATI telephone interview technique. The interviews were carried out by trained interviewers from the CATI centre located in CEM's premises in Krakow.

### SAMPLE GROUP

802 adult Poles were interviewed. The sample group consisted of people responsible for making technical decisions in their households. The proportionality of the sexes was controlled during the research to reflect their share in the general population. The respondents were randomly selected from databases with fixed line and mobile telephone numbers.

### RESEARCH TOOLS

The research was based on a standardised interview questionnaire, composed mainly of closed questions.

## INTRODUCTION

This section of the report presents the results of an opinion poll analysing attitudes towards energy saving in households. The research was conducted on a representative sample of Poles.

Given the increasing energy demand and the worsening economic crisis, rational energy use in households is perceived by energy experts as a solution to reduce the country's energy problems as well as households' energy bills. A large number of Poles lived for many years in a system that did not stimulate rational energy use. Cheap energy, which constituted one of the main advantages of socialist rule, led to the development of negative consumer habits. Despite the ever increasing costs of utilities, these habits are still present in Poles' social awareness. As a society we have to learn from scratch how to save. This includes not only immediate measures, such as turning off unnecessary lighting, but also long term planning and investing, having in mind benefits that will materialise in the more distant future.

The aim of this research was to analyse and measure three components of social attitudes towards energy saving: knowledge on how to save energy, emotional attitudes towards the very idea and actions taken in order to reduce energy consumption. These components were reflected in research questions, which referred to the following issues:

- in the cognitive component: the recognisability of information and education campaigns, the assessment of your own knowledge on energy saving solutions and their effects;
- in the emotional component: the assessment of the efficiency of energy saving measures in households;
- in the behavioural component: the application of various energy saving solutions.

The results of the research allow for moderate optimism. They show that energy saving is gaining importance in the Polish society. What is more, our drivers to save energy are becoming more and more complex. We save energy not only because we

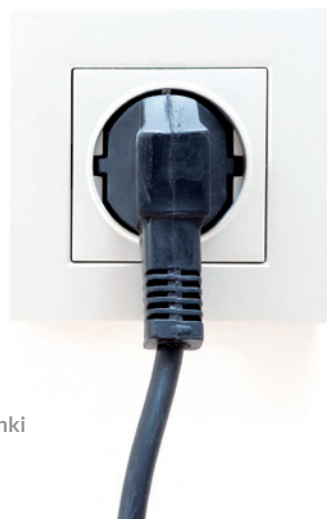
lack money (though this issue still constitutes the most important driver and will most probably remain so). Poles are also beginning to perceive this problem from the perspective of other issues, such as environmental pollution, global warming or even state energy security. We have also started to notice information on energy saving that comes from a variety of sources, which is a positive development. We are familiar with education campaigns and we are also trying to look for information on our own.

Nevertheless, Poles' knowledge of energy saving issues still remains scarce. This is worrying and should be regarded as a challenge for future information and education measures. Energy saving is associated mainly with reduced consumption of electricity, while rational use of energy for heating is frequently disregarded. Issues connected with heat energy saving remain too complicated, while information is insufficiently available. Authors of information and education campaigns contribute to this situation, as they focus much more on reducing electricity consumption, at the same time marginalising or even ignoring the topic of the rational use of energy for heating buildings and preparing domestic hot water (DHW). Therefore, future social campaigns should be expanded to include information in this area. The research shows also that the Internet constitutes a significant source of knowledge on energy saving. People notice information and education campaigns mainly on television but look for knowledge in the Internet. This means that an effective campaign promoting energy saving has to include a properly prepared internet portal that will constitute a knowledge base for people seeking further information.

Poles are convinced that rational energy management can bring positive tangible results, not only for individual consumers but also for the whole country. We see solutions to the energy problems of our country in energy efficiency improvement and renewable energy development rather than in the construction of nuclear power plants.

## RECOGNISABILITY OF INFORMATION AND EDUCATION CAMPAIGNS PROMOTING ENERGY SAVING

The results of the research show that information and education campaigns reach their target groups and are increasingly more recognisable. As many as 44% of the respondents claim that within the last year they have noticed some information or education measures on the reduction of energy consumption in houses and apartments. The main channel through which they were reached was television. Information and education campaigns conducted via this channel during the last year were undoubtedly effective. Nevertheless, it should be noted that their effects were reinforced by the marketing measures of electricity distributors, as their advertisements frequently referred to electricity saving. Moreover, some distributors utilised other channels, such as leaflets or brochures, to reach their target groups. This message was also strengthened by the growing popularity of energy saving issues in the media, as a result on the one hand of systematic energy price increases in recent years and on the other of the worsening global economic crisis. Due to all these factors, energy consumers have become more sensitive to energy saving issues, which has increased the recognisability of information and education campaigns. Analysis of the recognisability of information campaigns in different socio-demographic groups shows that education is the only variable that differentiates respondents in their familiarity with such measures. The more educated a respondent is, the more likely it is that such campaigns are noticed. Other attributes, e.g. age or gender, do not differentiate the interviewees.



Did you notice during last year any information or education actions promoting energy saving in houses and apartments?

	Total	Gender		Age				Education		
		Woman	Man	Up to 34 years	35–45 years	46–59 years	Over 59 years	Primary	Secondary	Higher
Yes	44%	44%	44%	40%	43%	46%	45%	28%	44%	55%
No	56%	56%	56%	60%	57%	54%	55%	72%	56%	45%
Sample (N)	802	402	400	92	186	265	258	156	386	258

The recognisability of education and information campaigns conducted in 2012 was analysed also by means of prompting – the respondents listened to descriptions of activities performed during a particular campaign and asked to say whether they were familiar with the campaign. It has been observed that campaigns conducted by different subjects are often confused. This ensues from the fact that they follow the same convention, share similar goals and lack significant differentiating factors (with the possible exception of the campaign “Wyłączamy prąd – Włączamy oszczędzanie”). For the same reasons social campaigns are sometimes confused with commercial measures undertaken by energy distributors. Therefore, the data presented below should be interpreted rather as trends and not the actual levels of recognisability for respective campaigns.

The respondents heard descriptions of the following information and education campaigns:

- “Polska Efektywna Energetycznie” [Energy Efficient Poland] – this provided information about the benefits of energy efficient solutions for companies, conducted by the Polish Society for Entrepreneurship.
- “Czas na Oszczędzanie Energii” [Time to Save Energy] – this presented issues connected with the profitability of energy saving solutions, conducted by the Ministry of the Economy.
- “Wyłączamy prąd. Włączamy oszczędzanie” [Turn off power – Turn on savings] – two famous professors, Jerzy Bralczyk and Zbigniew Lew-Starowicz, encourage people to save electricity, conducted by the Ministry of the Environment.

The data show that the campaign “Wyłączamy prąd. Włączamy oszczędzanie” was the most recognisable – as many as 56% of the respondents claimed to have noticed the campaign. More often these were people aged 35–45 and people

Have you seen any of the following information and education campaigns that promote reduced energy consumption?

	Total	Gender		Age				Education		
		Woman	Man	Up to 34 years	35–45 years	46–59 years	Over 59 years	Primary	Secondary	Higher
Wyłączamy prąd. Włączamy oszczędzanie	56%	59%	53%	54%	65%	57%	48%	45%	56%	62%
Czas na Oszczędzanie Energii	22%	24%	20%	21%	18%	25%	23%	26%	22%	20%
Polska Efektywna Energetycznie	11%	11%	11%	4%	13%	14%	8%	14%	11%	9%
Sample (N)	802	402	400	92	186	265	258	156	386	258

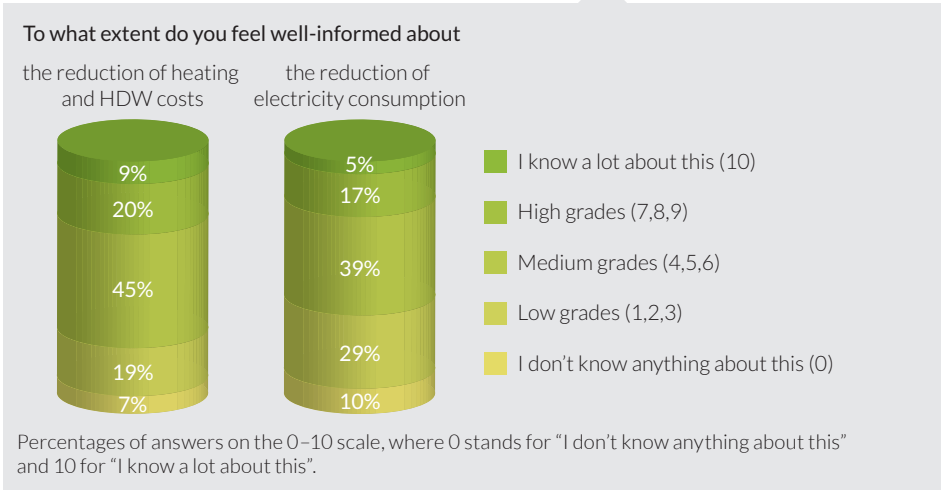
with higher education. Much of the campaign's success should be attributed to the wide application of television spots – this channel was the most frequently cited in spontaneous responses as the medium presenting information and education measures regarding energy saving. It may be also assumed that thanks to this particular campaign the percentage of people who claimed to have seen information and education activities on energy saving in 2012 was so high. The remaining two campaigns were noticed much less frequently. “Czas na Oszczędzanie Energii” was cited by 22% of the respondents and “Polska Efektywna Energetycznie” by 11%.

## INFORMATION NEEDS IN ENERGY SAVING SOLUTIONS

The results of the research show that Poles feel slightly better informed about possible solutions for reducing electricity consumption than in the case of limiting the use of energy for heating and domestic hot water. In both cases, however, the respondents are rather critical about the level of their knowledge on consumption and cost reduction. Nearly every third respondent claims that their knowledge about the possibilities for heating and DHW cost reduction is limited or non-existent. A further 45% assess their knowledge as medium. The percentages for the reduction of electricity consumption are similar – 22% and 39% respectively.



Only every fourth respondent assesses their knowledge on heating and DHW cost reduction as extensive or very extensive. For electricity this percentage is much higher and amounts to 39%. These data directly reflect the content of the messages presented to the public, which to a large extent focus on electricity consumption and saving, marginalising or totally ignoring the issues connected with heat energy.



As for heating and HDW cost reduction, men and people aged 35–45 assess their knowledge higher. The evaluation of one’s knowledge, with regards to both types of energy, increases with one’s level of education.

Graph 10

To what extent do you feel well-informed about	Gender			Age				Education		
	Total	Woman	Man	Up to 34 years	35–45 years	46–59 years	Over 59 years	Primary	Secondary	Higher
the reduction of heating and HDW costs	5,9	5,6	6,1	5,7	6,3	5,7	5,8	5,0	5,8	6,5
the reduction of electricity consumption	6,6	6,5	6,6	6,4	6,7	6,6	6,5	5,7	6,6	7,7
Sample (N)	802	402	400	92	186	265	258	156	386	258

Percentages of answers on the 0–10 scale, where 0 stands for “I don't know anything about this” and 10 for “I know a lot about this”.

The results of the research show that, regardless of gender, age or education, Poles would like to know more about energy saving solutions. In all socio-demographic groups around 60–70% of the respondents confirm that they would like to know more about these issues. The younger the respondents, the larger the demand.

Would you like to know more about energy saving solutions in your house/apartment?	Total	Gender		Age				Education		
		Woman	Man	Up to 34 years	35–45 years	46–59 years	Over 59 years	Primary	Secondary	Higher
Definitely yes	27%	27%	27%	21%	26%	28%	30%	26%	29%	27%
Rather yes	40%	40%	39%	51%	46%	41%	29%	37%	39%	40%
Rather no	22%	23%	21%	20%	21%	22%	25%	24%	22%	22%
Definitely no	10%	8%	11%	7%	7%	7%	15%	12%	8%	10%
Difficult to say	1%	2%	1%	2%	0%	2%	2%	0%	2%	1%
Sample (N)	802	402	400	92	186	265	258	156	386	258

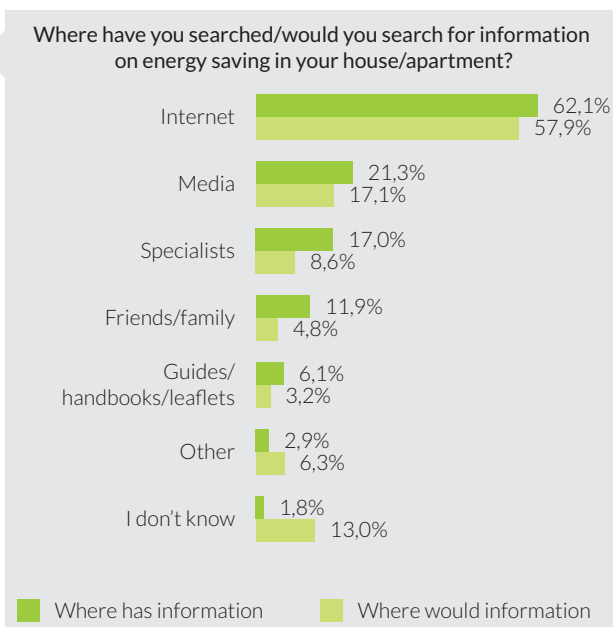
Every third respondent admits that they have searched for tips on how to save energy. On the other hand, the data show that two thirds of Poles have not been sufficiently interested in the issue to look for information. Men and people aged 35–45 search for such information much more frequently. The respondents' level of education also has an impact here – the higher the education, the more willing they are to initiate such activities.

Have you ever searched for information on reducing energy consumption in your house/apartment?	Total	Gender		Age				Education		
		Woman	Man	Up to 34 years	35–45 years	46–59 years	Over 59 years	Primary	Secondary	Higher
Yes	34%	27%	42%	32%	46%	37%	25%	21%	35%	43%
No	6%	73%	58%	69%	54%	63%	75%	79%	65%	57%
Sample (N)	802	402	400	92	186	265	258	156	386	258

The Internet is the most frequently cited source of knowledge on energy saving solutions. People who already have looked for information on energy saving decided to search for it in the Internet (62% of the respondents in the analysed group). More than half of the respondents who have not searched for such information claim that they would start with the Internet (58% of the respondents in the analysed group). The respondents refer to specialist portals and forums as well as the simplest method of browsing through the Internet's resources by means of a search engine. As one could expect, the declarations on the use of the Internet are closely connected with the respondents' age and education. For example, in the group of people who have already searched for information on energy saving, the Internet is cited as a source of information by around 80% of the respondents aged up to 45. In the group of people aged over 59 this percentage drops to 33%, though this result can still be perceived as high. Older people are more willing to search for information in the media; they pay attention to commercials and press articles. Among younger respondents this channel is marginalised.

When looking for information we also turn to people with specialist knowledge. Every seventh respondent who has already sought information on energy saving used this source of information. For recommendation and advice we ask shop assistants, contractors and fitters, while help from family and friends is used less frequently. Handbooks, guides and leaflets are also rather unpopular. People who have already looked for information on energy savings rarely refer to this source. Similarly, people who have not searched for such information also do not cite it frequently.

Graph 11



## ENERGY SAVING PATTERNS IN HOUSEHOLDS

According to nearly half the respondents electric energy for powering domestic appliances as well as audio and video devices constitutes the largest component of the operation and maintenance costs in the residential sector. Only 18% of the re-

spondents claim that heating costs have the largest share, though objectively they usually account for the largest part of operation and maintenance costs in Polish households. A similar number of people chose energy consumed by lighting and energy for preparation of hot domestic water (16% each) as the main component of energy expenditures.

The above data show that we are often unaware of the real costs that we pay for respective utilities. In multi-family buildings heating costs are frequently hidden in a set of payments for various services. They are also distributed over the period of a whole year. As a consequence, people are not aware of real costs of heating. In single-family buildings the situation is different. The data from this research confirm that this group of respondents more frequently refers to heating as the most burdensome expenditure among maintenance costs. This difference occurs also when the respondents are divided according to the type of heating they use. People who use district heating or solid fuels cite heating as the most costly component the least frequently, while people who use gas or other fuels do it more often.



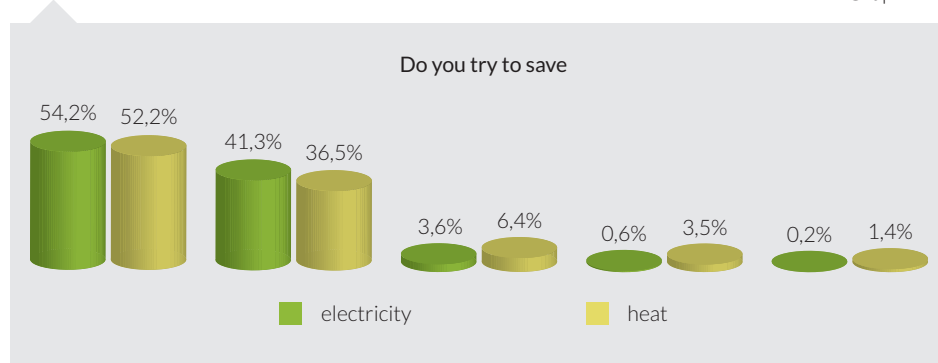
Which component represents the largest share in energy costs in your house/apartment?	Building type			Heating type			
	Total	Single-family	Multi-family	District heating	Coal/wood	Gas	Other
Lighting	16%	15%	17%	21%	18%	4%	4%
Domestic appliances, audio and video devices	45%	43%	49%	51%	44%	40%	41%
Heating	18%	20%	15%	12%	13%	38%	48%
Difficult to say	16%	17%	15%	12%	20%	13%	4%
Don't know	5%	5%	4%	4%	5%	5%	4%
Sample (N)	802	486	316	226	413	136	27

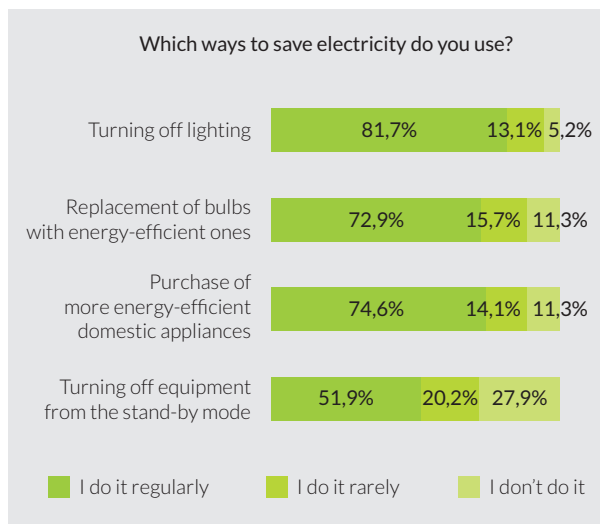
A large majority of the respondents declare that they try to save energy. The percentage of people claiming to be doing so is higher for electric than for heat energy. Most of the interviewees, when asked about ways to save energy, spontaneously focus on electricity, e.g. turning off unnecessary lighting, using energy efficient bulbs or appliances. The saving of the energy necessary for heating or the preparation of hot domestic water is mentioned much less frequently.

Turning off unnecessary lighting constitutes the most popular way to save power. As much as 80% of people remember to do it on a regular basis. Energy efficient bulbs are gaining popularity – 73% of the respondents declare that they buy them regularly, while a further 16% say they do it from time to time.

As energy-saving issues are slowly beginning to influence our daily decisions, more and more often we take into consideration the energy efficiency of new domestic appliances. The actual extent of this impact is difficult to estimate, but as much

Graph 12





Graph 13

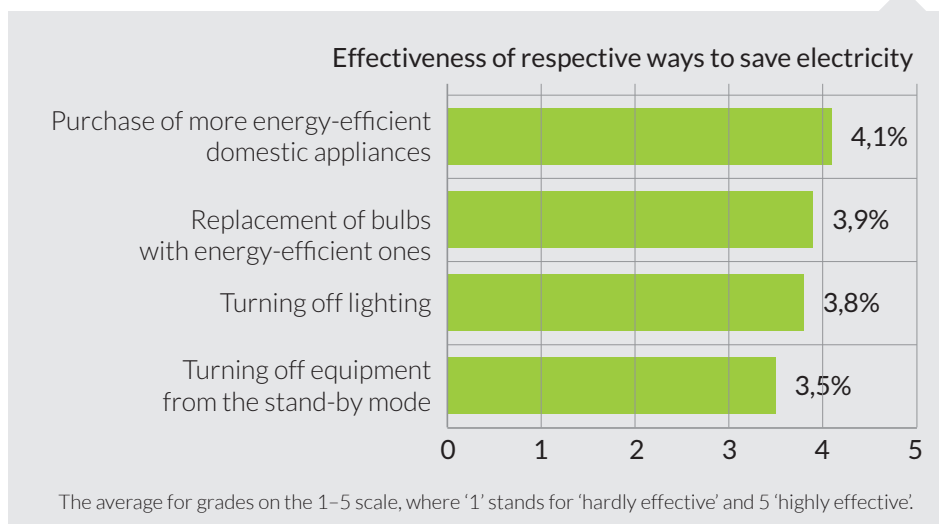
as 75% of the respondents claim that they always try to choose energy-efficient appliances. Turning off our appliances and devices from the stand-by mode constitutes the least frequently used method for electricity saving. Half of the respondents claim to be doing it regularly while a further 20% say they do it, albeit rarely. 28% of the interviewees admit that they do not pay attention to this issue.

The replacement of domestic appliances with more

energy-efficient ones is considered as the most effective way to save electricity. Energy-efficient bulbs are cited as second, while turning off unnecessary lighting comes third. We are least convinced about turning off equipment from its stand-by mode.

As far as heat energy saving is concerned, the replacement of windows constitutes the most popular solution – it has been applied in 86% of households analysed. A large number

Graph 14



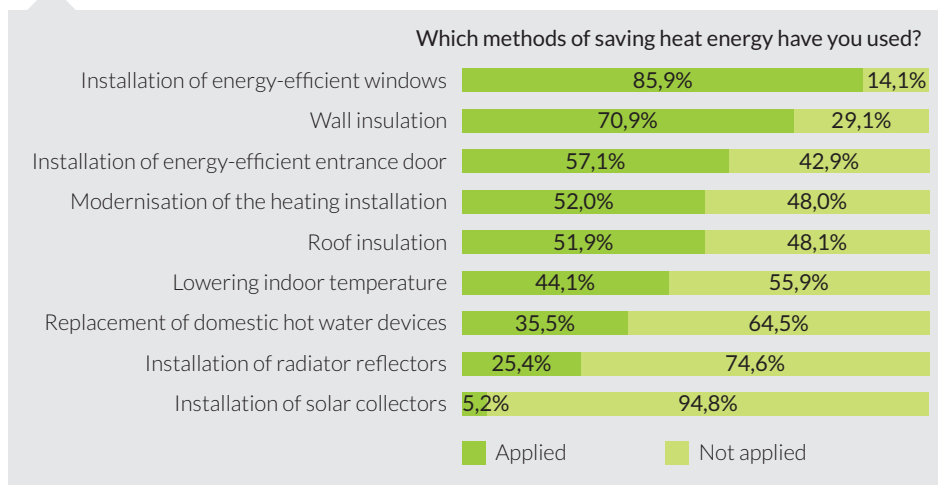
of respondents (70%) declare that their outer walls have been insulated. Over half of the respondents cited also replacement of an entrance door with a more energy-efficient one, modernisation of their heating installation and roof insulation. On the other hand, the data shows that nearly half of the interviewees use obsolete, energy-intensive heating installations and live in buildings with no roof insulation.

Poles are usually accustomed to high thermal comfort in their living quarters during the heating season. This is probably the reason why only 44% claim that they try to save heat energy by reducing temperature in rooms. Apart from habit, this may be a result of the fact that many multi-family buildings lack the technical equipment for individual temperature control, while the balancing systems do not motivate users to save heat energy.

Most multi-family buildings with individual heat meters for apartments are equipped with obsolete balancing systems based on heat cost allocators. Very frequently they fail to sufficiently reward the inhabitants that save heat, discouraging them from making such efforts.

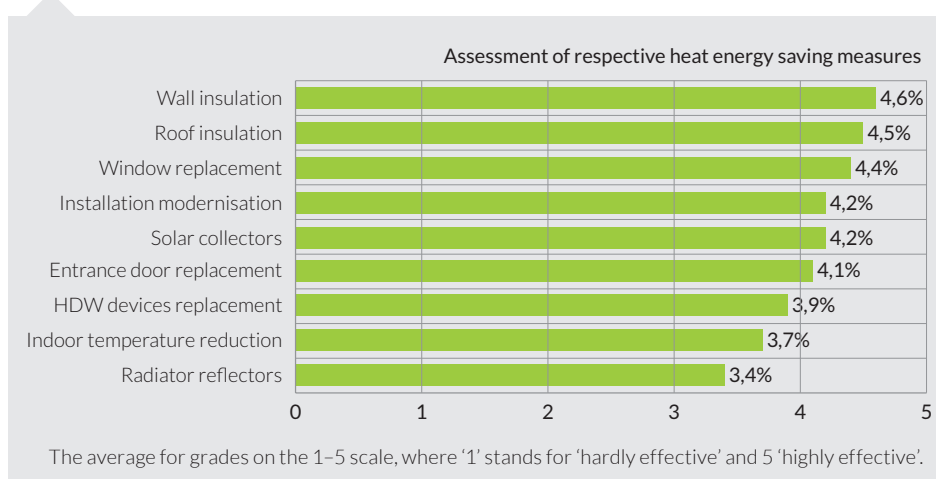
Radiator reflectors are applied rather rarely. Only every fourth respondent refers to them. On the other hand, the use of solar collectors is increasing. Already 8% of the respondents from the single-family sector refer to this solution.

According to the respondents, the insulation of the building envelope, i.e. the insulation of walls and the roof, and the installation of energy-efficient windows constitute the most effective solutions to save heat energy. The modernisation of the heating installation, the use of solar collectors and the replacement of an entrance door are cited as next. The least cost-intensive solutions, i.e. lowering indoor temperature and the installation of radiator reflectors, are perceived as the least effective.



Graph 15

As one might expect, the main motivation for decreasing energy consumption in our homes is to reduce the burden on our household budgets. The higher the energy prices, the more visible and profitable the results of any energy-saving measures. Therefore, it is highly probable that further energy price increases will promote energy-saving behaviour. As many as 73% of the respondents perceive economic reasons as highly important. Over half of the respondents (60%) acknowledge the significance of energy-saving measures in the improvement of the thermal comfort in a building.



Graph 16



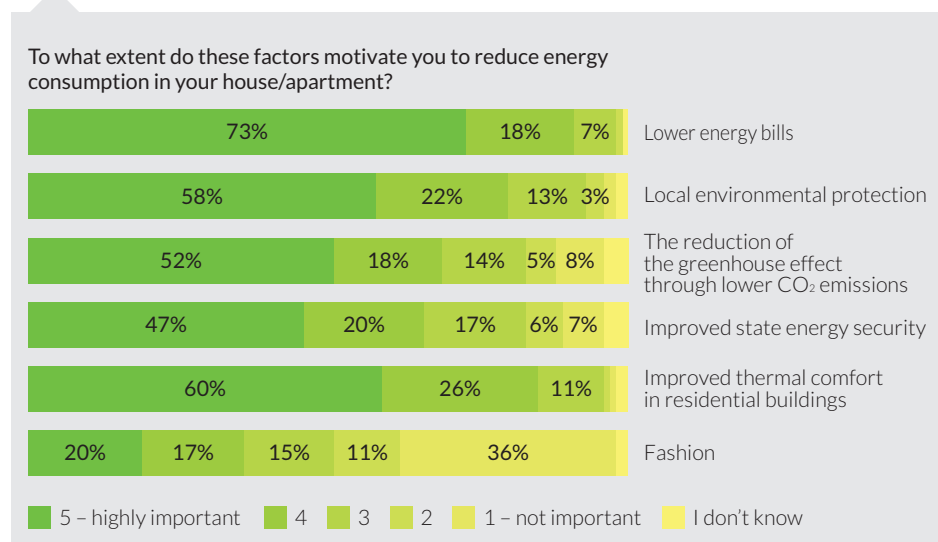
This shows that Poles invest in energy saving not only to decrease maintenance costs but also to improve the comfort of their lives. Environmental motivation also appears important. For over half of the respondents (58%), improvement of the local environment constitutes a highly significant result of saving energy. The global perspective of these measures, e.g. reduction of the greenhouse effect or improvement of Poland's energy security, is noticed less often.

Interestingly, as many as 20% of the respondents choose the fashion for saving as a highly important motivation. It is more popular among less educated and older people.

It should be also stressed that utilitarian motivations that benefit people in general, such as environmental protection or the country's energy security, are much more popular with women than men. The latter are focused more on economic issues and improvement of their personal comfort.

The research shows that we are increasingly convinced about the high profitability of integrated thermal modernisation. Over 60% of the respondents believe that expenditures in this field are paid back after a maximum of 10 years. Two thirds of the people in this group believe that this period is shorter than five years. Only every tenth Pole holds the opinion that the payback period for thermal insulation investments exceeds ten

Graph 17



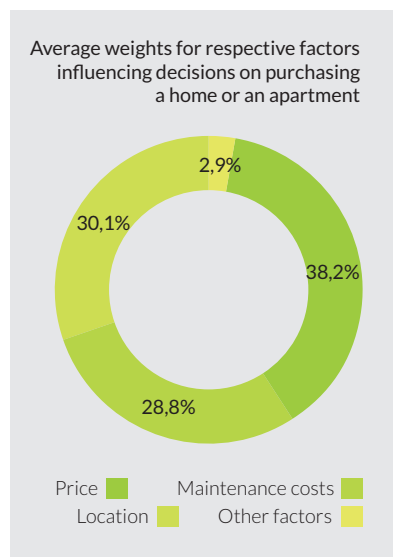
years. Men and people with higher education tend to be slightly more sceptical about these issues. It is worth noting that every fourth respondent is not able to identify his or her motivating factors, which also proves that knowledge on the effects of thermal renovation remains scarce.

What is the payback period for integrated thermal insulation of buildings?

	Total	Gender		Age				Education		
		Woman	Man	Up to 34 years	35–45 years	46–59 years	Over 59 years	Primary	Secondary	Higher
Up to 5 years	39%	42%	35%	49%	41%	42%	30%	39%	40%	37%
6–10 years	23%	13%	32%	22%	24%	23%	21%	21%	19%	29%
11–15 years	6%	3%	10%	5%	9%	6%	5%	6%	5%	8%
Over 15 years	3%	2%	3%	0%	3%	2%	4%	2%	2%	3%
They never pay back	2%	3%	1%	3%	2%	1%	2%	2%	2%	2%
Difficult to say	28%	37%	20%	21%	21%	26%	39%	31%	32%	21%
Sample (N)	802	402	400	92	186	265	258	156	386	258

In order to estimate the hypothetical impact of factors related to the operation and maintenance costs on consumer decisions when purchasing real estate, the respondents were asked to specify weights for respective factors that are taken into consideration in this process. The graph and the table present average weights for the factors that influence the choice of real estate. As one might expect, price obtained the highest weight – an average of 38%. Location came as second – an average of 30%, with operation and maintenance costs close behind it – an average of 29%. The remaining factors obtained significantly lower weights. The research shows that maintenance costs are beginning to play an important role in purchase decisions and it may be expected that their significance is going to increase considerably. Presently, however, these data should be treated only as research results, as reliable data

Graph 18



on maintenance costs usually are not presented during transactions on the real estate market.

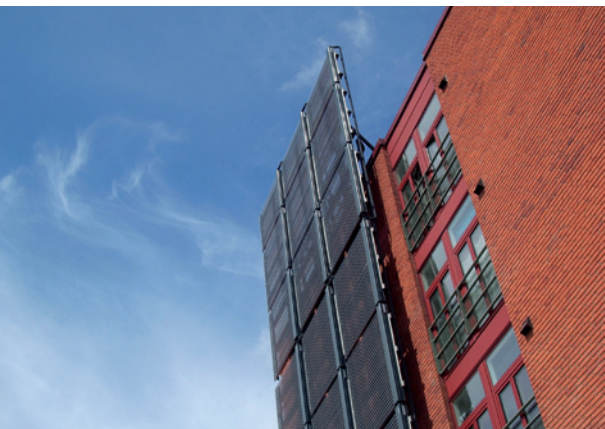
## ENERGY-EFFICIENT BUILDINGS

The research shows that people are widely familiar with the term “energy-efficient buildings”. Nearly 80% of the respondents claim to have already heard the term, which proves that information on energy-efficient buildings is reaching increasingly wider social groups. Looking at respective socio-demographic segments one may observe that men and people aged 35–59 declare familiarity with this term slightly more often. People aged over 59 are a little less familiar with this concept, though even here 70% claim to have heard about it, which is a very good result. Familiarity with the concept of “energy-efficient buildings” is closely correlated with education. The higher the education, the more respondents confirm that they know the term. Nearly 90% of people with higher education are familiar with this concept, while for people with primary education this share falls to less than 60%.

Have you ever heard about “energy efficient buildings”?	Total	Gender		Age				Education		
		Woman	Man	Up to 34 years	35–45 years	46–59 years	Over 59 years	Primary	Secondary	Higher
Yes	78%	73%	84%	76%	84%	81%	73%	58%	80%	89%
No	22%	27%	16%	24%	16%	19%	27%	42%	21%	11%
Sample (N)	802	402	400	92	186	265	258	156	386	258

Familiarity with the term “passive building” is much lower than for “energy efficient buildings” and reaches only 29%. However, considering that this term has been introduced to public discourse only recently, this result may be interpreted as

a positive one. Earlier the term was used by a narrow group of specialists following trends in energy efficient construction.



Due to the quantitative character of this research, it is impossible to verify how many people who declare their familiarity with the term know its proper definition. It is probable that some respondents know only the term and are not aware of the criteria behind it or may even interpret them incorrectly.

Men and younger respondents, below 46, more often claim to know the term “passive buildings”. The share of people familiar with this concept is particularly high among interviewees aged 35–45. Similar to the term “energy efficient buildings”, there is a strong correlation between knowledge of the concept and level of education.

Have you ever heard about “passive buildings”?

	Total	Gender		Age				Education		
		Woman	Man	Up to 34 years	35–45 years	46–59 years	Over 59 years	Primary	Secondary	Higher
Yes	29%	17%	41%	34%	45%	28%	19%	14%	25%	46%
No	71%	83%	59%	66%	55%	73%	81%	86%	75%	54%
Sample (N)	802	402	400	92	186	265	258	156	386	258

A surprisingly large part of the respondents claim to have heard that pursuant to EU law the Polish legislation on energy standards for new buildings will be made much more stringent. Around 38% of the respondents have heard that from 2021 all new buildings will have to comply with demanding energy consumption norms. Interestingly, the oldest group of the respondents is most aware of these issues. The percentage of people familiar with the above legal changes increases linearly with age and education.

Have you heard that from 2021 all new buildings will have to comply with stringent energy consumption norms?

		Gender		Age				Education		
	Total	Woman	Man	Up to 34 years	35–45 years	46–59 years	Over 59 years	Primary	Secondary	Higher
Yes	38%	33%	42%	28%	32%	37%	47%	26%	38%	45%
No	62%	67%	58%	72%	68%	63%	54%	74%	62%	55%
Sample (N)	802	402	400	92	186	265	258	156	386	258

Poles have no doubt that energy efficient buildings constitute a good solution in times of economic crisis as well as growing energy and environmental problems. Over 90% of the respondents claim that constructing energy efficient buildings is a profitable strategy. It is worth noting that over half of the respondents in this group strongly agrees with this opinion and this support is not correlated with gender or education. In general, the older the respondents, the more willing they are to agree with this point of view.

Do you think that construction of energy efficient buildings is economically viable?

		Gender		Age				Education		
	Total	Woman	Man	Up to 34 years	35–45 years	46–59 years	Over 59 years	Primary	Secondary	Higher
Definitely yes	51%	51%	52%	38%	47%	54%	56%	42%	55%	51%
Rather yes	39%	41%	37%	50%	43%	37%	35%	46%	37%	39%
Rather no	4%	3%	6%	8%	4%	4%	3%	4%	4%	5%
Definitely no	1%	1%	1%	2%	1%	2%	0%	2%	1%	2%
Difficult to say	4%	4%	5%	2%	5%	3%	5%	6%	4%	4%
Sample (N)	802	402	400	92	186	265	258	156	386	258

Poles are convinced that construction of energy efficient houses is much more expensive than traditional technologies. A large part of the respondents hold the opinion that energy efficient technologies are 21–50% more expensive than standard ones. Every tenth interviewee believes that they are even 50% more costly. This confirms the hypothesis that one of the elements of the common image of energy efficient technologies are

their high price and the resulting limited availability for a wider group of people. This opinion reinforces the popular belief that energy saving can be practiced mainly by wealthy people and prosperous societies.

How much more expensive are energy efficient houses compared with traditional houses?

	Total	Gender		Age				Education		
		Woman	Man	Up to 34 years	35-45 years	46-59 years	Over 59 years	Primary	Secondary	Higher
Around 5%	2%	2%	1%	0%	3%	2%	0%	2%	2%	0%
6-10%	5%	5%	5%	5%	2%	5%	6%	4%	4%	7%
11-20%	25%	21%	29%	30%	28%	24%	23%	18%	23%	32%
21-50%	45%	44%	46%	44%	48%	48%	39%	43%	47%	43%
More than 50%	8%	9%	7%	12%	9%	7%	6%	13%	9%	4%
Difficult to say	16%	20%	12%	9%	10%	14%	26%	20%	16%	14%
Sample (N)	724	370	354	81	166	242	235	137	355	231

Most of the respondents are convinced that energy efficient buildings will have a significant impact on the reduction of carbon dioxide emissions in Poland and will contribute to lower air pollution. Interestingly, the groups that are the most sceptical about this are people younger than 35 and people with higher education. Every seventh respondent from these two groups claims that energy efficient buildings will not have a strong impact on global emission reduction.

Is the construction of energy efficient buildings an effective way to reduce CO<sub>2</sub> emissions in Poland?

	Total	Gender		Age				Education		
		Woman	Man	Up to 34 years	35-45 years	46-59 years	Over 59 years	Primary	Secondary	Higher
Definitely yes	54%	56%	53%	37%	44%	58%	64%	47%	61%	48%
Rather yes	36%	37%	35%	48%	44%	35%	27%	45%	32%	36%
Rather no	5%	3%	8%	13%	8%	3%	4%	3%	3%	11%
Definitely no	2%	1%	3%	2%	3%	2%	2%	1%	2%	3%
Difficult to say	3%	4%	1%	0%	2%	3%	4%	5%	2%	2%
Sample (N)	802	402	400	92	186	265	258	156	386	258

Nearly every third respondent claims to have heard about subsidies for energy efficient buildings and apartments offered by the National Fund for Environmental Protection and Water Management for individual investors that are constructing their home or purchasing their apartment. Men are slightly more familiar with this information – as many as 35% have heard about it. Awareness of the programme is also more widespread among people with higher education (39% compared with 25% in the group of people with primary education).

Have you heard about the programme of subsidies for energy efficient buildings and apartments offered by the National Fund for Environmental Protection and Water Management for individual investors constructing their home or buying their apartment?	Total	Gender		Age				Education		
		Woman	Man	Up to 34 years	35–45 years	46–59 years	Over 59 years	Primary	Secondary	Higher
Yes	30%	25%	35%	24%	32%	31%	30%	25%	26%	39%
No	70%	75%	65%	76%	68%	69%	71%	75%	74%	61%
Sample (N)	802	402	400	92	186	265	258	156	386	258

Poles agree that the government should initiate more measures for promoting and supporting energy efficient buildings. Only 4% of the respondents do not agree with this. The share of people with higher education in this group is higher than the average.

Should the Polish government undertake more measures to promote and support energy efficient buildings?	Total	Gender		Age				Education		
		Woman	Man	Up to 34 years	35–45 years	46–59 years	Over 59 years	Primary	Secondary	Higher
Yes	93%	95%	91%	90%	88%	95%	95%	92%	94%	92%
No	4%	2%	5%	7%	7%	2%	2%	3%	2%	6%
I don't care	1%	1%	1%	1%	1%	2%	1%	1%	1%	1%
Difficult to say	3%	3%	2%	2%	4%	2%	2%	4%	3%	1%
Sample (N)	802	402	400	92	186	265	258	156	386	258

## GENERAL ATTITUDES TOWARDS ENERGY SAVING

The great majority of Poles is convinced that climate change and global warming are genuine processes and not just unjustified scientific theories. 42% of the respondents strongly believe that these processes are occurring, while further 39% support this claim. On the other hand, climate change and global warming are questioned by every seventh respondent. Scepticism shows more frequently in men, as every fifth male respondent denies these phenomena. As many as 18% of the interviewees with higher education doubt that these processes occur. Age differentiates opponents and supporters to a little extent – there are slightly more sceptics among younger people.

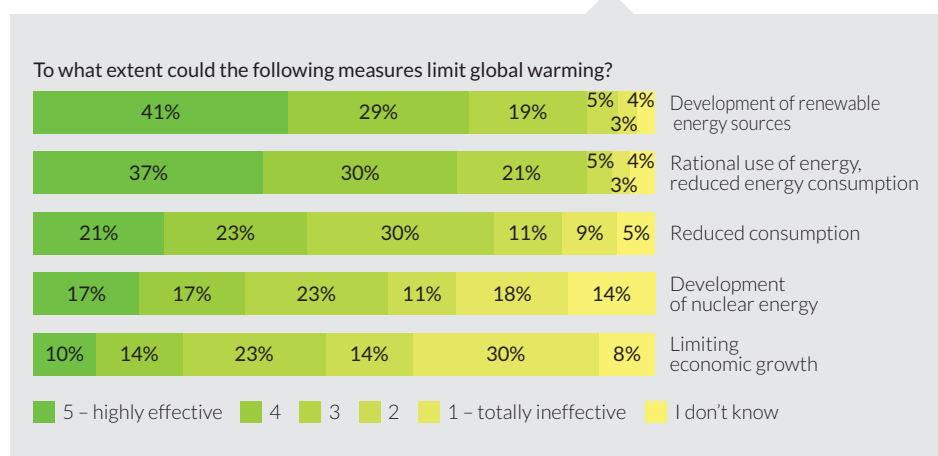
Do you believe that climate change and global warming are really occurring on Earth?	Total	Gender		Age				Education		
		Woman	Man	Up to 34 years	35–45 years	46–59 years	Over 59 years	Primary	Secondary	Higher
Definitely yes	42%	47%	37%	47%	39%	42%	42%	37%	42%	44%
Rather yes	39%	39%	38%	35%	39%	43%	35%	43%	40%	33%
Rather no	11%	6%	15%	11%	13%	9%	11%	8%	10%	14%
Definitely no	4%	2%	5%	5%	4%	4%	2%	5%	3%	4%
Difficult to say	6%	6%	5%	2%	5%	3%	10%	8%	5%	5%
Sample (N)	802	402	400	92	186	265	258	156	386	258

Therefore, the question arises of how to stop global warming and which measures are the most effective? The graph below presents an assessment of the effectiveness of five measures. All of them may potentially contribute to reducing global warming. The effectiveness of each of them was assessed on a scale of 1 to 5, where 1 stands for the lowest effectiveness, and 5 for the highest. The ranking leaves no doubts that in the opinion of Poles, renewable energy source development, energy efficiency



improvement and energy saving constitute the most effective measures for preventing climate change. The total of 70% of the respondents deem RES development as highly or rather effective. For energy efficiency this share amounts to 67%.

The results of the research show that we are rather sceptical about the effectiveness of nuclear energy development. Only 34% of the respondents believe that this measure could be effective in preventing global warming. Fewer people also seek solutions to the climate problem in consumption reduction. However, this measure has quite a significant share of supporters (43% perceive it as effective). Only every fourth Pole holds the opinion that limiting economic growth could be an effective means of stopping the advance of global warming.



Graph 19

Every third respondent is convinced that saving energy in households can be helpful in solving Poland's energy problems. A further 46% are willing to support this opinion. This shows our belief in the impact of measures implemented at the individual level on countrywide problems. In general men are more sceptical about this than women. Middle aged people (35-59) are also more likely to treat this impact with greater reserve than the youngest (below 35) and the oldest (over 59).

Can energy saving in households have an impact on solving Poland's energy problems?

	Total	Gender		Age				Education		
		Woman	Man	Up to 34 years	35–45 years	46–59 years	Over 59 years	Primary	Secondary	Higher
Definitely yes	32%	33%	31%	24%	23%	31%	43%	35%	36%	26%
Rather yes	46%	50%	42%	60%	49%	44%	42%	50%	42%	50%
Rather no	16%	13%	20%	10%	22%	20%	12%	10%	18%	18%
Definitely no	4%	2%	6%	5%	5%	4%	4%	3%	3%	6%
Difficult to say	1%	1%	2%	1%	2%	2%	1%	3%	1%	1%
Sample (N)	802	402	400	92	186	265	258	156	386	258

The research shows that there is significant social support for utilising renewable energy. In general, one may conclude that Poles are convinced that the use of renewables may contribute to solving their country's energy problems. As many as 88% of the respondents hold this opinion.

Can the increased use of renewable energy constitute an effective solution to Poland's energy problems?

	Total	Gender		Age				Education		
		Woman	Man	Up to 34 years	35–45 years	46–59 years	Over 59 years	Primary	Secondary	Higher
Definitely yes	44%	44%	44%	40%	41%	45%	46%	44%	46%	41%
Rather yes	45%	45%	44%	46%	50%	43%	42%	47%	43%	45%
Rather no	7%	6%	9%	10%	7%	7%	7%	2%	7%	11%
Definitely no	2%	1%	3%	3%	2%	2%	2%	3%	1%	3%
Difficult to say	2%	4%	1%	1%	2%	2%	4%	5%	3%	1%
Sample (N)	802	402	400	92	186	265	258	156	386	258

Poles not only believe in the positive effects of wider RES application in the Polish energy sector, but are also willing to financially participate in the development of this type of energy. As many as 44% of the respondents declare that they would be willing to pay more for electricity from renewable sources.

Every third respondent from this group claims to be ready to pay a maximum of 5% more compared with the current energy prices. 38% of the interviewees would accept increases of up to 10%, while the remaining 27% of up to 15% of the current price. Women are slightly more willing to pay more for renewable energy. Similarly, the youngest people (up to 34 years old) are also ready to bear some costs of RES development to a larger extent than the remaining socio-demographic groups.

Would you be willing to pay more for electricity from renewable sources? If so, how much more (in %)?

		Gender		Age				Education		
	Total	Woman	Man	Up to 34 years	35-45 years	46-59 years	Over 59 years	Primary	Secondary	Higher
Yes, maximum 5% more	16%	19%	13%	21%	14%	17%	14%	19%	14%	17%
Yes, maximum 10% more	17%	21%	14%	17%	20%	16%	16%	14%	17%	19%
Yes, maximum 15% more	3%	2%	4%	3%	3%	5%	2%	1%	3%	4%
Yes, maximum 20% more	6%	6%	6%	9%	5%	6%	5%	4%	7%	6%
Yes, over 20% more	3%	3%	3%	5%	2%	2%	2%	3%	2%	3%
No	51%	42%	59%	39%	53%	50%	53%	52%	52%	48%
Difficult to say	5%	8%	3%	5%	3%	4%	9%	7%	6%	3%
Sample (N)	802	402	400	92	186	265	258	156	386	258

# LOCAL GOVERNMENTS' EXEMPLARY ROLE IN RATIONAL ENERGY MANAGEMENT – A SUMMARY

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The full version of the report  
is available in Polish at:  
[www.ies.org.pl](http://www.ies.org.pl)

The report from the research "Local  
governments' exemplary role in  
rational energy management" was  
commissioned from CEM Market  
and Public Opinion Research  
Institute by the Institute of Environ-  
mental Economics and the Heinrich  
Boell Foundation.

The main objective of this study is to initiate in Poland a debate on the possibilities of implementing the concept of the public sector's exemplary role in energy efficiency improvement measures. The research team interviewed leaders, experts and opinion-forming individuals from three groups involved in energy efficiency issues, namely:

- non-governmental organisations,
- business,
- local government.

The interviews were conducted according to special scenarios, adjusted to each group of respondents. All in all, the research team carried out 12 in-depth interviews, i.e. four interviews per group.

The research attached particular importance to the possibilities of fulfilling the exemplary role in the construction of buildings with enhanced energy performance. This ensues from the following reasons:

- a) public institutions are significant investors and their buildings are usually visited by many people (libraries, hospitals, schools, offices);

- b) new possibilities for co-financing the construction of public buildings with improved energy performance have appeared (the LEMUR programme of the National Fund for Environmental Protection and Water Management);
- c) the exemplary role is also inscribed into the implementation scenario for nearly zero energy buildings (NZEB), as according to the current legislation public buildings will have to be constructed according to the NZEB standard two years earlier than other buildings (so that public institutions can show other subjects how to construct such buildings).

The study clearly shows that stakeholders expect the public sector to fulfil an exemplary role, while leaders in the public sector discern possibilities for this. However, there are numerous barriers (described below) that hinder this process.

The public sector's exemplary role in energy efficiency has been defined directly and indirectly in Polish strategic documents and legislation. The discussion about the ways and means to fulfil this role in Poland has been inspired by basic European legislative acts: Directive 2010/31/EC and Directive 2006/32/EC. The latter states that "Member States shall ensure that the public sector fulfils an exemplary role in the context of this Directive. To this end, they shall communicate effectively the exemplary role and actions of the public sector to citizens and/or companies, as appropriate. Member States shall ensure that energy efficiency improvement measures are taken by the public sector, focussing on cost-effective measures which generate the largest energy savings in the shortest time-span. Such measures shall be taken at the appropriate national, regional and/or local level, and may consist of legislative initiatives and/or voluntary agreements [...] or other schemes with an equivalent effect." This provision is strengthened by Directive 2010/31/EC, which after 2018 obliges the public sector to construct all its buildings in accordance with the nearly zero energy standard.

Public institutions should be, therefore, equipped with relevant tools and measures in order to fulfil this exemplary role. This role should be implemented in all areas of government involvement. However, it should be particularly visible in investments that have a direct impact on energy consumption (from green procurement, through construction of new buildings, to education).

It is significant that this role is defined – somebody should act as an energy efficiency leader. The word ‘exemplary’ means: one that may serve as an example, a model, one that should be copied, one that stands out and is better than the average. But it also involves greater organisational as well as financial effort. Exemplary actions usually trigger higher costs that have to be paid for solutions that today may be expensive and are not legally binding but that will constitute a standard in the future. Public institutions are rather poor, and in order to fulfil the exemplary role they will be forced to pay for the higher investment, financial and maintenance risk.

Public institutions will be able to play the exemplary role only if they receive support in this respect (additional costs are covered from external sources). Directing the burden of the extra costs resulting from the exemplary role to already tight budgets of public institutions would be irrational.\*

\*<http://www.portalsamorzadowy.pl/gospodarka-komunalna/samorzady-buduja-coraz-mniej-noclegowni,22464.html>  
– an article on the small scale of investments conducted by local government.

Bearing in mind the barriers and the legislative provisions, the exemplary role should be fulfilled in accordance with the needs of different stakeholders. Numerous questions arise regarding the priorities and actions that should be implemented. The feasibility of the public sector’s exemplary role in the construction of buildings with increased energy efficiency should refer to the diagnosis of the situation, stakeholders’ needs and suggestions of necessary actions. The aim of this report is to verify to what extent Poland is ready to fulfil the above obligations and what is the current stage of their implementation.

This material about the public sector’s exemplary role in energy efficiency and its fulfilment in Poland provided input for a sitting of the Parliamentary Group for Energy entitled “How to implement the exemplary role of the public institutions in the field of energy efficiency?” (October 22, 2012, Warsaw), which was organised by the Heinrich Böll Stiftung, the Institute of Environmental Economics and the office of the MP, Andrzej Czerwiński. The meeting allowed for better identification of stakeholders’ needs and opportunities for the public sector to promote energy efficiency.

The opinions of the stakeholder groups presented below are formulated on the basis of answers to the following research questions:

- What do public authorities know about the EU provisions on their exemplary role?
- To what extent does the state fulfil these obligations?
- How is the public sector prepared to implement these directives?
- What is the current situation in the public sector regarding energy efficiency standards in new buildings?
- What might be the possible impact of the public sector's exemplary role on social attitudes in these areas?
- What barriers hinder the implementation of these directives?
- Which mechanisms and incentives are required for the successful implementation of these directives in Poland?



## NGO SECTOR

### – MAIN RESULTS

The respondents in this group include representatives of NGOs dealing with sustainable development, energy efficiency and energy management.

#### **Officials are unaware of the public sector's exemplary role in rational energy management**

NGO representatives unanimously claim that people responsible for managing public buildings are largely unaware of the exemplary role that should be fulfilled by the public sector in efficient energy use. This low awareness diminishes the significance of legislation and impedes the implementation of any measures in this area. The respondents from this group claim that public officials have only superficial knowledge of energy efficiency directives. They lack detailed knowledge on respective provisions and on solutions allowing their practical transposition to everyday practice. Energy efficiency measures, and even more so activities resulting from the exemplary role, are perceived mainly as additional obligations and burdens, and as such tend to be marginalised.

Energy efficiency is one of the many areas that are treated with lesser priority than many of the public sector's statutory obligations, e.g. education. Only a narrow group of specialists possesses detailed knowledge regarding energy efficiency provisions. There are also few municipalities whose authorities are interested in energy issues and understand that efficient energy use may bring financial profits and image benefits. These municipalities undertake various energy efficiency improvement measures (e.g. Bielsko-Biała, Częstochowa, Poznań, Warsaw). The involvement of a particular municipality in energy issues depends largely on its officials' personal interests and motivation rather than on widespread practices, legislative obligations or an awareness of possible benefits. Marginalisation of the public sector's energy intensity in national legislation strengthens the impression that this problem is not particularly significant for state policy.

#### **Lack of clear legislative measures**

The respondents expressed a highly negative opinion about the implementation of the energy efficiency directives in Poland. They claim that Polish legislation in this respect does not refer directly to specific measures or tasks, which reduces the possible budgetary burdens that could be triggered by the new provisions. In the opinion of the interviewed NGO representatives, Polish legislators limited national measures only to a formal implementation of the EU provisions, purposefully leaving the practical side out of focus.

“...The directive of 2006 on the energy performance of buildings attached a lot of importance to the exemplary role. However, its transposition to the Polish legislation has been delayed and rather formal. Everyone knows that the new obligations imposed on the public sector will not be enforced.”

Moreover, the legislators did not provide for effective control measures over the public sector's obligations in energy management, including the exemplary role. Therefore, legislation in this area is lacking enforcement provisions. By failing to pay sufficient attention to whether these tasks are fulfilled or not central bodies are sending a signal that officials will not be held accountable for the practical implementation of these provisions.

It seems that a lack of political will to initiate concrete measures constitutes one of the key barriers to effective implementation of the aforementioned directives. This is exemplified by deleting the obligation of 1% energy savings in the public sector



from the final version of the Polish legislation. Politicians are unwilling to introduce changes in this area, while officials may rest assured that there will be no major consequences of failing to fulfil the obligations defined in the Polish legal system.

### **Thermal renovation investments do not always comply with the exemplary role**

Many public buildings in Poland have undergone thermal renovation. There are also numerous sources of financing for such investments. However, the main reason behind many of these projects is to modernize buildings and not to reduce their maintenance or energy costs. As a result, many of these investments are justified neither by their energy efficiency performance nor by their economic viability – they are implemented because funding is easily available. Inclusion of RES sources allows for the obtaining of additional funds for modernisation (e.g. the installation of solar collectors in schools although in summer, when the collectors are most effective, schools are closed).

Thermal renovation investments are rarely used to promote energy efficient behaviour or solutions. The public sector does not conduct social marketing activities on the basis of these investments, and this type of marketing is indispensable to properly fulfilling the aforementioned exemplary role. Some of the respondents claim that even cities with successful energy management rarely use these achievements to enhance their image among inhabitants.

“The project itself, without telling the story why it was implemented, remains a technical project. Local people should always be informed about the actions of their authorities and the reasons behind them.”

### **Low social awareness**

Energy efficiency and the environmental performance of buildings do not constitute major points of public interest. The public sector does not educate local communities in this respect as due to low social interest, such activities are not deemed particularly useful. On the other hand, social awareness is not increasing due to a lack of education and information initiatives. As a result, individual investors that construct houses or buy flats are not interested in energy efficient solutions and prefer the short-term benefits of a lower price over long-term savings on maintenance costs.

According to the respondents, this situation could be changed only by a nationwide education campaign presenting practical solutions and explaining the scale of the problem. These activities should be enhanced by positive examples from the public sector.

### **The public sector's exemplary role is of key importance for promoting good practices**

Most of the public buildings in Poland do not set an energy efficiency example. On the contrary, they are constructed at the lowest possible costs, ignoring future maintenance costs. The state should set an example, showing its citizens how to improve their standard of living. Public buildings are visited by a lot of people and information on their modernisation should be interesting, clear and easily available. NGOs expect public administration to play a more active, leadership role.

### **The public sector is not ready to construct nearly zero energy buildings**

The public sector has rather limited knowledge on the legal changes that will come into force in 2018. Even individuals interested in the issue lack information on how to reach the nearly zero energy standard. New public buildings usually comply only with the unambitious energy intensity norms specified in Polish construction law and rarely exceed this standard. This results partly from the current public procurement legislation, as the possibility to include energy efficiency as a tender criterion is limited. As a result, people responsible for investments in the public sector have little experience in buildings that exceed the minimum requirements.

The respondents refer also to the passive attitude of central bodies in preparing the public sector for the aforementioned changes. Even basic guidelines are lacking, e.g. a definition of a nearly zero energy building or a schedule of subsequent steps in moving towards this standard. The preparatory process is already delayed, as the nearly zero energy standard will be binding

“The standards for new buildings do not promote energy efficiency. [...] The current situation of new buildings is worse than prior to the energy performance directive, as these buildings already qualify for thermal modernisation. Polish norms are much more lenient than in other European countries.”

within six years. One of the key issues is to define a schedule for legal changes, so that decision makers are able to prepare. Other countries, e.g. Germany, have already initiated this process.

## BUSINESS SECTOR

### – MAIN RESULTS

The respondents in this group include people that are directly connected with the construction sector: leading producers of construction materials, a representative of a company designing and manufacturing technologically advanced construction solutions and a representative of the Chamber of Architects.

#### **The state's involvement in the promotion of the exemplary role is limited**

The business sector has a largely negative opinion about the public sector's involvement in the promotion of modern construction standards. The respondents claim that a majority of public officials prefer following well-established patterns to supporting innovative initiatives. They are afraid to go beyond standards, being concerned with the reaction of their supervisors and local communities.

The respondents also referred to faulty public procurement law, which forces lowest cost solutions. This unfortunately translates to meagre quality. Maintenance costs are usually ignored at the design stage, with focus being on construction/investment costs.

The respondents mentioned also ineffective energy efficiency legislation and its faulty implementation. They referred to two areas – how legislation is formed and how it is enforced. In the interviewees' opinion, EU provisions on the exemplary role are reflected in Polish law. However, their form makes it difficult to motivate the public sector to follow them.

“Everyone limits their actions to the necessary things, no one wants to stick their neck out. There's this obligation to keep the costs down in order to win public tenders, so that's the problem.”

### **The private sector has much greater achievements in energy efficiency promotion than the public sector**

It appears that the private sector is much more active in promoting energy efficiency than the public sector. The business sector thinks in the long term and compares the costs and benefits of energy saving measures. A growing number of companies conduct corporate social responsibility initiatives, including sustainable energy management. The private sector is aware that energy efficiency may bring profits, not only through increased sales but also through conducting modernisation investments in order to benefit from energy savings, e.g. under the ESCO model, which is gaining popularity in Poland.

Although the main reason behind producers' education activities is to increase the level of sales, they are much more successful in promoting energy efficiency solutions than public institutions (e.g. model energy efficient houses built by Velux or ABB).

### **The public sector can be more effective in fostering positive energy efficiency practices than the business sector**

Despite considerable achievements in the development of positive energy efficiency models, the respondents claim that the public sector could be much more effective in these activities than the private sector, as the public sector has much better opportunities to communicate with local inhabitants. Moreover, people are rather cautious when it comes to solutions promoted by business. The fact that commercial bodies are guided by their interests weakens their message. Public institutions, on the other hand, should serve public interests, which makes their message more trustworthy.

### **Construction norms are lagging behind technological development**

Legally binding construction norms do not keep pace with the opportunities offered by new technologies. Unfortunately most

public buildings do not exceed these norms. As a result, even new buildings are technologically backward. There has always been a discrepancy between technology and norms, but in the area of energy efficiency it is too large.

### **Public bodies lack specialists in modern energy management**

Not only business representatives but also local authorities refer to a lack of staff who are properly qualified in sustainable energy management. Public bodies explain that this derives from limited funding, forgetting that employing such people would substantially reduce the energy costs that have to be covered from the local budget.

### **Energy performance depends on available funding**

The scope of modernisation frequently depends on the availability of funding for different types of investments rather than on the cost and benefit balance or functional considerations. Due to the wide access to funding for renewables, these energy sources are often included in investments although the buildings are not properly adjusted to utilise this energy. The cause and effect relationship has been reversed, as the shape of the project depends on the available funding, instead of adjusting the funding to the needs.

### **Energy education should be also targeted at professionals, including architects and construction designers**

Energy management issues are often excluded from the education process of architects and construction designers in Poland. It appears that energy efficiency is not prioritised by the majority of architects and construction designers. This results from the low significance of energy efficient solutions for investors. Architects focus on form and functionality instead, as these aspects make their buildings more attractive to investors. Energy saving solutions usually cannot be easily seen, which makes them uninteresting for investors and creators. Therefore, the



education of architects and construction designers holds special significance. They can fulfil an essential role in the promotion of energy efficient solutions, as they have a considerable impact on shaping mainstream trends in construction. What is more, they are perceived as independent and objective participants in the market and create an opinion-forming group.

“not much is happening [...]. We are aware that the government is doing nothing. They think that there is still a lot of time before the directive enters into force, so they will deal with this later.”

### **Central bodies are not preparing the public sector for construction of nearly zero energy buildings**

The business representatives unanimously claim that central bodies are neglecting preparations for the changes that will come into force in 2018. Most of the public officials are unfamiliar with this topic and only a few specialists are aware of the coming legal changes. The respondents stress that central bodies have not developed a schedule for implementing the nearly zero energy standard, not to mention mechanisms or model activities.

### **Central bodies do not send clear messages about legislative changes**

The respondents demand that central bodies present a clear schedule of legislative changes, so that subjects in the construction market have time to adjust to them. As this schedule is lacking, it is difficult for public units as well as commercial subjects to make strategic decisions. Knowledge about future frameworks is crucial for business development planning. Given this lack of information about future standards, public bodies and private companies do not know if their development strategies and current activities are justified and meaningful.

### **Development of technologies for nearly zero energy buildings has not been finalised**

Despite the wide availability of various energy efficient products and technologies, ready-made and integrated solutions offering comprehensive and rational energy management in buildings are still difficult to find. This results from a number of factors, one of which being the high prices of modern technologies. Only a few buildings include a whole variety of energy efficient solutions, which in turn hinders promotion of this subject among architects and designers. Moreover, construction workers do not have sufficient opportunities to master these technologies. This means that people who will be responsible for the construction of nearly zero energy buildings do not possess sufficient knowledge and experience. All this poses a considerable challenge for the governmental institutions responsible for energy efficiency in the construction sector.

### **Awareness raising should be based on model solutions**

Legislative changes, the introduction of financing mechanisms and the development of integrated technical solutions will not bring the expected results without proper awareness raising initiatives. Education activities should be targeted at various groups, not only architects and designers but also society in general. According to the respondents, this will allow for the development of social control mechanisms; local communities will start monitoring whether their authorities fulfil their obligations in energy efficiency. Awareness raising activities should make use of architectural models promoting energy efficiency in an understandable way.



## PUBLIC SECTOR – MAIN RESULTS

The interviewees included officials from municipalities of various sizes and characters (rural, urban). The municipalities belong to the Association 'Energie Cites', which supports local authorities in rational energy management. All the respondents have wide experience in energy efficiency and sustainable development measures.

### **The state does not support local government in rational energy management**

Local government representatives expressed highly negative opinions about state support for their energy management initiatives. They confirmed that central bodies do not control whether already existing obligations imposed on local authorities are followed. The respondents praised the wide availability of funding offered by government-related institutions but criticised legislative measures taken by the state, namely the transfer of responsibilities for local energy policy and the lack of enforcement mechanisms.

“All the new provisions are soft, they just say that we should do something, but they do not define concrete obligations.”

### **The lack of legislation is interpreted as no need for action**

Local government representatives expressed considerable reservations with regard to energy management legislation. In their opinion, the legislation does not specify clearly which energy management tasks fall within the obligations of local authorities. It provides recommendations but does not include clearly defined requirements. Moreover, the current regulations make it impossible for local government to choose the form of their implementation. Apart from this, the legislation does not define in a clear manner the methods for verification of the results. According to the respondents, the formal requirements to be fulfilled by local authorities in energy policy development and management are going to be even more lenient under the new legislation. For example, legislators are considering the removal of the energy planning obligation from the Energy Law Act. Such a change would considerably limit local authorities' influence on local energy policy and would further hinder implementation of the EU legislation on energy efficiency.



## **The provisions of the Energy Law Act on energy planning increase the importance of local authorities**

The obligation to develop local energy policies provides local authorities with a stronger position in negotiations with energy companies. This allows for better consideration of public interests, such as long-term energy security or minimisation of environmental impacts from energy consumption. Local governments will not be treated as partners by energy companies if they do not possess an independent energy plan.

## **A platform for communication between the central administration and local governments is missing**

The respondents referred also to limited opportunities to communicate with central bodies. They complain that the central administration does not treat local authorities as partners in dialogue and marginalises their role in certain areas, including energy management. Their views are not taken into account during the legislative process.

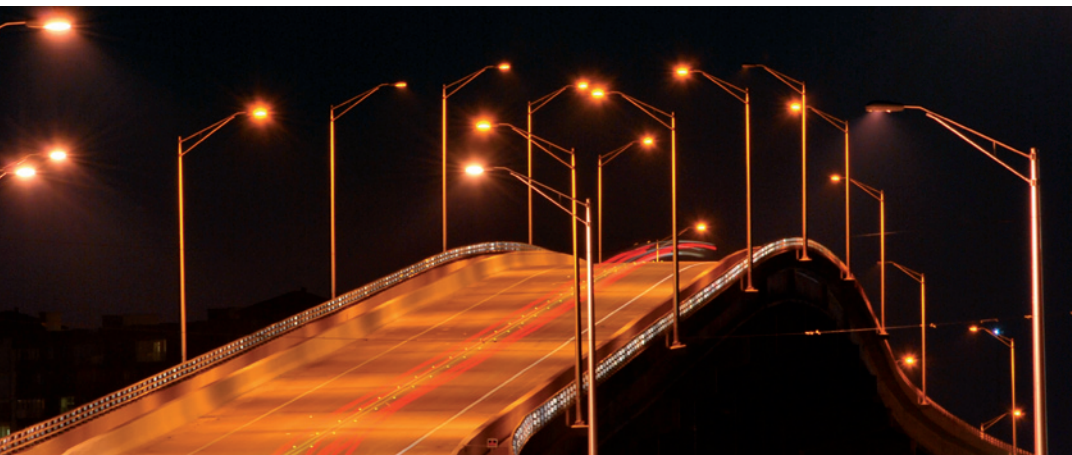
## **Authorities have low awareness of the public sector's exemplary role**

Local government representatives confirm that the public sector is largely unaware of its obligation to fulfil an exemplary role in energy efficiency. Research shows that only 41% of municipalities have adopted assumptions to the plan for supply of heat, electricity and gaseous fuels or the plan itself. What is more, many of these documents are no longer valid. Half of the municipalities declare implementation of the energy and climate package (3 x 20%) but only 10% monitor the results of their activities\*. These data show that energy policy development is often treated as a burdensome obligation and is not fulfilled by many municipalities.

Numerous examples confirm the significant role of local government in creating models for local communities. Examples of municipalities that have successfully implemented their energy efficiency and rational environmental management policies show that models developed by the public sector, i.e. the sector that is the closest to local communities, may have a very strong impact. Public institutions from smaller localities stand particularly a high chance of gaining social trust. Innovative measures

“Local authorities repeatedly stress that central administration does not fully acknowledge what local authorities are able to achieve. We assume that this could be changed by educating the central administration, so that they understand how important a partner we are.”

\* Gmina planuje i zarządza energią, stan obecny i perspektywy w świetle wyników badań FEWE i planowanych zmian legislacyjnych, Sławomir Pasierb, Szymon Liszka, Jakub Czajkowski, Małgorzata Kochoń, Polish Foundation for Energy, Katowice 2011.



undertaken by municipal authorities foster positive social attitudes in various walks of life. Education plays an immensely important role in this context. Many municipalities realise thermal renovation investments, but only a few use them to educate the public and communicate with local people.

#### **Energy consumption monitoring constitutes the basis for rational energy management**

All municipalities that have successfully implemented energy efficiency schemes started from comprehensive metering and energy consumption analysis. Other important initial steps include the analysis of managed resources and the definition of investment needs. Cooperation between local government and energy companies and academic institutions is also crucial.

#### **Energy planning may require establishing special units**

The respondents stress that effective energy efficiency measures can be implemented only if local governments pay sufficient attention to rational energy management. Such authorities often establish special departments for energy planning and employ well-qualified staff specialising in these issues. Although this involves additional costs, professional employees may generate much more savings on energy costs. Moreover, such a department guarantees a certain continuum in energy management and multiannual investments despite changes in authorities due to elections.

**A large majority of local governments is not prepared to implement the new construction standards**

The respondents admit that local authorities are completely unprepared to introduce the new construction standards, which are envisaged for 2018. Not only do they lack knowledge about the requirements, they are even unaware that such changes are going to take place. Therefore, immediate action by central bodies is essential – they have to initiate a widespread information and education campaign targeted at local authorities and undertake necessary legislative measures. The respondents believe that central bodies should prepare a road map defining a schedule and tools for reaching the new construction standards.

“We expect the state authorities to prepare the necessary legal, financial and organisational measures that can be applied at the local level. They should say who will be responsible for what and when, and how we are going reach the targets.”

# A NEW APPROACH TO COST EFFECTIVENESS

JAN RĄCZKA

In 2008 the National Fund for Environmental Protection and Water Management was considering whether it should support thermal modernisation. Initially I opposed this idea, as the pure energy effect, or indirect environmental effect, of thermal modernisation is rather meagre. Its cost effectiveness is also relatively low.

Later, however, I changed my mind and came to a conclusion that thermal modernisation should be viewed in a wider perspective – as a way to improve social services, stimulate local markets for construction services and reduce the public sector's operation costs. It also provides energy and environmental benefits.

In 2010 we decided to step up our efforts in this field. At the same time we started using a more adequate term, i.e. “energy management in public buildings”. We wanted to supplement standard thermal modernisation activities with energy saving measures, e.g. indoor lighting, monitoring.

The National Fund has always paid attention to environmental effects and cost effectiveness. The latter was usually calculated by means of simplified, static measures, e.g. investment outlays divided by emissions avoided in the first year after the investment's completion. In 2008 we started to apply a more dynamic index on a wider scale, namely the dynamic generation cost (DGC). Despite the obvious problems with estimating operational costs, I do defend this index, as it stems from a well-grounded microeconomic theory (DGC provides an approximation of the average unit cost) and can be related to (at least as far as the order of magnitude is concerned) economic categories

## JAN RĄCZKA, PhD

Jan Rączka holds a PhD in economics. 2008–2012 he was the President of the Board of the National Fund for Environmental Protection and Water Management. 2001–2004 he worked as a lecturer at the Faculty of Economic Sciences at the Warsaw University. 2003–2008 he was employed as a financier at the European Bank for Reconstruction and Development. Earlier, 1993–1995, he worked for the CEE Forum of the Batory Foundation.

present in daily life. For example, the DGC value for the collection and treatment of one cubic metre of sewage can be associated with the fee paid by a household to a water distribution and sewage collection company.

The application of understandable economic categories is crucial for effective communication with the public, for high quality social dialogue and also for making rational political and economic decisions.

This approach proved uniform only in one area, namely, climate protection. It is easy in this field to define a common environmental measure – namely avoided CO<sub>2</sub> emissions. What is more, this measure is independent of the location of emissions, as CO<sub>2</sub> constitutes a global, not local, environmental problem. Due to the consistent and methodologically coherent calculation of DGC, expressed in PLN per tonne of avoided CO<sub>2</sub>, the National Fund now possesses a cost database for over ten different priority programmes.

In many of the National Fund's priority programmes, the cost effectiveness index constitutes the only criterion for selecting applications during calls for proposals. In this manner the Fund follows the rather obvious assumption that available support should be provided for projects which guarantee the largest environmental effect for society per one PLN. This is a rational approach, as it allows for purchasing the largest "amount" of environmental effect for the same financial resources.

The cost effectiveness index provides an important source of information – thanks to which we are able to compare the cost effectiveness of energy saving in large industrial plants (high effectiveness) with that of public transport fleet replacement (low effectiveness). This is a unique database, and it is up to the National Fund and political decision makers how it will be applied for further development of environmental policy measures. The database is still far from perfect, but consistency and continued calculation of the index in the next few years will improve its usefulness and accuracy. It does not cost much, but enables more rational spending of public funds.



# SUSTAINABLE ENERGY MANAGEMENT AS A TOOL FOR THE DEVELOPMENT OF A LOW CARBON ECONOMY

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Sustainable Development Director at the Polish National Energy Conservation Agency. Lecturer at the Department of Civil Engineering at the Warsaw University of Technology and Vice-President of the Board of the Association of Polish Energy Auditors. Co-author of numerous scientific publications, technical elaborations and press articles about construction and energy efficiency in the economy. Author of expert reports for the Ministry of Economy, the Ministry of Finance, the Ministry of Environment, the Chief Inspectorate for Environmental Protection, Polish Energy Grids, the Ministry of Transport and Construction, the National Fund for Environmental Protection and Water Management. Project manager and team member in projects implemented under Phare, Save, 5<sup>th</sup> Framework Program, 6<sup>th</sup> Framework Program, Intelligent Energy Europe and bilateral programmes. Awarded the Gold Cross of Merit by the Polish President for his achievements in the field of energy efficiency in the construction sector.

Despite the fact that the times of a centrally planned economy are well gone and the invisible hand of the market has become the decisive factor, we will not escape planning. It even occurs in the market economy and is especially significant in strategic, strongly monopolised fields, such as the energy sector.

*In Poland, however, effective energy planning combined with a long-term climate policy practically does not exist.*

The Preparation of Assumptions for Municipal Plans for the Supply of Heat, Power and Gaseous Fuels (pursuant to the Energy Law Act) is not adjusted to the needs of a modern, low-carbon economy (an unimaginable concept at the end of the 1990s, when this provision was introduced). The scope of energy planning in municipalities is rather narrow and the process does not support the implementation of the main objectives of state energy policy, sustainable development policy and climate protection policy.

Article 5 (7) of Directive 2012/27/EU on energy efficiency states that Member States shall encourage public bodies, including at regional and local level, to:

- adopt an energy efficiency plan, freestanding or as part of a broader climate or environmental plan, containing specific energy saving and efficiency objectives and actions, with a view to following the exemplary role of central government buildings;

- put in place an energy management system, including energy audits, as part of the implementation of their plan;
- use, where appropriate, energy service companies and energy performance contracting to finance renovations and implement plans to maintain or improve energy efficiency in the long term.

The EU guidelines show that there is a need in Poland for a new system of energy planning and management at the local and regional level.



Presently, there are numerous planning documents at the municipal level. Frequently, they are not connected with each other, while the investments and measures which are carried out result more often from the opportunity to secure financing than from a well-thought-out development plan. As the analysis of possible problems related to local energy use and generation is insufficient, they frequently occur where they are least expected.

There is no point in constructing a new local thermal power plant if prior to this we do not conduct thermal renovation of the buildings serviced by this facility. Before new local generation sources are put into operation, the energy grid should be modernised.

All this requires funding. Currently, state policies do not translate directly to actions performed by local authorities. As information from the municipal level does not reach the central level, state plans, e.g. the National Energy Efficiency Action



Plan, do not relate to local measures in this field. There is a need to order these matters and to develop an integrated energy planning system: from the municipal level, through counties and voivodships, to the state level.

It is also necessary to prepare a system for the implementation of energy plans, i.e. a system of on-going energy management.

The above mentioned reasons for integrated energy management from municipal to country levels call for the introduction of a sustainable energy system, covering optimal energy planning and ongoing energy management.

Optimal energy planning should consist of:

- A definition of the needs of respective municipalities, countries and voivodships with regards to energy security, energy efficiency improvement, application of renewable or low carbon energy sources;
- A definition of their potential in energy supply, energy efficiency improvement, application of RES and economic development;
- A definition of the criteria for choosing investment, organisation, promotion and education measures and the specification of their desired effects;
- The optimal choice of the above measures by the relevant local authority. The results of this optimisation procedure should constitute a basis for a municipal Sustainable Energy Management Plan. Energy companies, including local enterprises as well as international concerns active in Poland, should participate in the planning process.

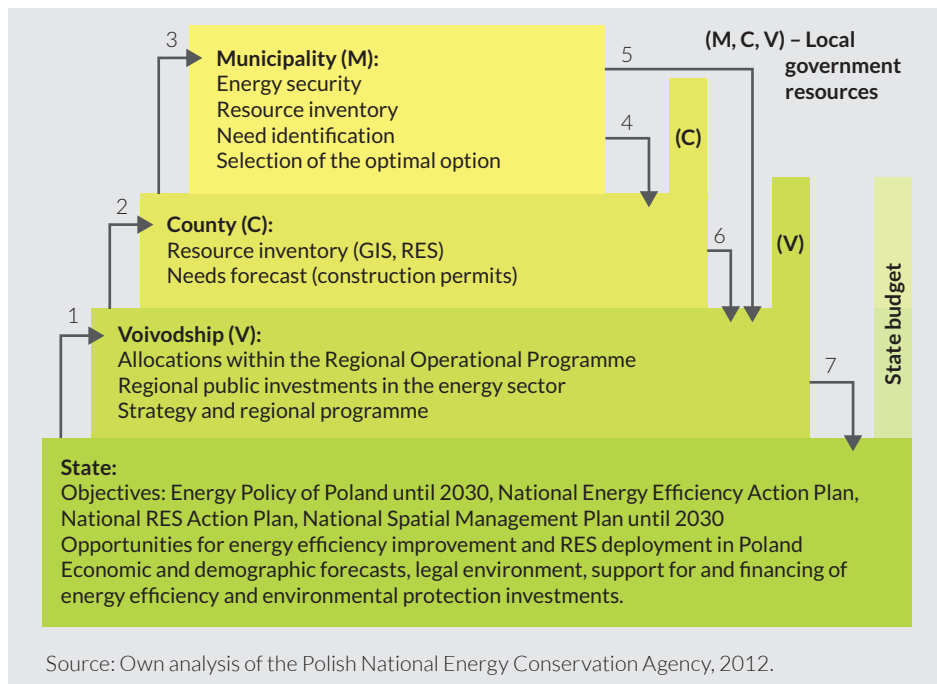
In the next step municipal plans should be combined at the higher administrative level (the county level – *powiat*). The optimisation of measures related to the assets and competence of the county should be also conducted at this stage. County and municipal plans should be further combined into a voivodship plan. Voivodships should submit their plans to the Ministry of Economy, Ministry of Environment and the Ministry of Regional Development. The Ministry of Economy, taking into consideration Poland's international commitments and national documents related to energy policy, would balance these plans and supplement them with mechanisms at the state level, producing a National Sustainable Energy Management Plan.

#### EWA WINKOWSKA, MA, MBA

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The figure below presents a scheme for optimal energy planning.



Graph 20

In order to choose the optimal measures in a particular administrative area, we need data on the effects of activities which have been implemented as well as the *status quo* prior to investments, e.g. heat energy consumption by education institutions and other municipal buildings before thermal modernisation and after it. This requires the introduction of a monitoring system. In many financial support programmes it is necessary to define the actual effects of planned investments. Monitoring data would be extremely helpful in fulfilling this requirement. The monitoring system should constitute an integral part of sustainable energy management.

The report of the European Court of Auditors, released in 2013, shows that the analysed energy efficiency improvement projects co-financed under the Cohesion Policy lacked rational objectives. They proved economically unviable while the costs per unit of saved energy were considerably too high. In its report to the European Commission the Court recommended that

financing for energy efficiency improvement should be conditional upon the regular monitoring and application of comparable effect indicators.

Optimal energy planning has been defined as follows: a set of measures undertaken within a local administrative unit during a defined period, aimed at minimisation of environmental impacts of energy generation and consumption within this unit, considering local development objectives and ensuring energy security within the unit.

The principle of multi-level planning is based on the following rules:

- national assumptions, uniform for all administrative units and prepared by the government, will constitute the basis for Sustainable Energy Management Plans (SEMPs) at all administrative levels;
- national assumptions will be supplemented by voivodship assumptions, which will take into consideration e.g. development plans of energy companies that supply electricity and gas in the voivodship;
- each county in a voivodship prepares an inventory of resources (RES, GIS) and development forecasts at the county level – next these materials are submitted to municipalities;
- a municipality prepares its SEMP based on data and guidelines from the remaining administrative levels;
- each administrative unit prepares its own SEMP, referring to its own resources;
- the energy planning objectives of the national assumptions follow the provisions of the Energy Policy for Poland until 2030 – administrative units define their objectives pursuant to their development strategies;
- the assessment of objectives and effects submitted to subsequent local government levels (e.g. from municipalities to counties) and next to the central level enables approval of the plans and monitoring of their results.

The second component of sustainable energy management within respective administrative units consists of:

- the implementation of an optimal energy plan within the unit;
- effect monitoring and submitting results to a higher level (e.g. municipalities to counties, counties to voivodships, voivodships to the Ministry of Economy).

The implementation of the proposed concept of sustainable energy management requires the employment of qualified staff at all administrative levels. Therefore, authorities should be obliged to appoint a person (or a team) that will be responsible for sustainable energy management within the relevant area of jurisdiction (municipality, county, voivodship). One person could provide services for several municipalities. Experience shows that municipalities which have employed an energy specialist are successful in rational energy management. Remuneration of these people is covered from savings on energy costs.

The sustainable energy management system, prepared by experts from the Polish National Energy Conservation Agency and the Institute of Environmental Economics, is universal and can be applied at each administrative level and in each local administration unit, regardless of its size or development stage. Sustainable energy management constitutes a tool for the sustainable development of a particular administrative unit.

Introduction of the concept (obligation) of sustainable energy management by municipalities, counties and voivodships will involve these subjects in the implementation of state energy policy. Approved in 2009, Energy Policy for Poland until 2030 states that local authorities should participate in the implementation of the priorities of state energy policy, in particular with respect to spatial and energy planning at the local level. Energy management at the municipal level is not an isolated activity. Objectives such as the energy security of the local economy and society, local environmental protection, economic development and protection of a municipality's inhabitants against excessive energy costs require a more holistic approach.

Although energy management at the municipal level has a local dimension, it influences:

- the region: through regional energy supply systems,
- the country: through state energy security and energy supply balance,
- the continent and the globe: through the common problems of pollutant emissions reduction and dispersion, including climate change prevention.

Thanks to the application of multi-criteria optimisation for energy planning it is possible to connect energy planning with strategic planning and to involve local administration units in the implementation of the climate protection objectives specified in government documents, e.g. energy efficiency improvement or GHG emission reduction.



Moreover, the proposed system provides local authorities with a number of further benefits, such as minimisation of the costs connected with the preparation of sustainable energy management plans as well as the costs of voivodship and powiat arrangements. At the same time it imposes a proper, basic standard for the document and a reference of the resources available in a relevant unit. It also leaves open the possibility to further develop the plan, depending on the unit's needs. It is expected that all the plans will be based on uniform assumptions (economic, demographic, spatial, geographic), applied also to energy supply forecasts and scenario analyses. This will ensure coherence among the plans, the aggregation of their results and the comparison of the achievements of respective administrative units.

It should be noted that Sustainable Energy Action Plans, which belong to one of the best European practices, constitute a special case of Sustainable Energy Management Plans. The only criterion for the selection of initiatives in energy efficiency improvement and RES development applied in the action plans is CO<sub>2</sub> emission reduction. Therefore, SEMP are a wider concept than the action plans, as they take into consideration not only environmental aspects, but also local economic development and local energy security.

Moreover, thanks to the identification of needs at each administrative level – municipal, county and voivodship – SEMP can be used in the preparation of state support programmes, regional operational programmes and strategies of the National and Voivodship Funds for Environmental Protection and Water Management. This will be a valuable contribution to the country's development policy in areas such as energy efficiency improvement and RES development.

It should be also stressed that the system of sustainable energy management eliminates the main barriers to energy planning in Poland. It provides municipalities with simple and understandable solutions instead of complicated bureaucracy, clearly defines the objectives of the plans and introduces the obligation to monitor and report on the achieved effects to subsequent levels of local administration and the state level.

The system of sustainable energy management and optimal energy planning should be introduced through an amendment to the Energy Law Act.

The Polish National Energy Conservation Agency has conducted in-depth interviews on energy planning in municipalities with representatives of municipalities and their associations, organisations and chambers. The most important conclusions from this research are summarised below.

A majority of local authorities are rather or completely unaware of the role played by energy planning in municipal management and the related benefits for local authorities and communities.

There are, however, several leaders that implement best European practices and develop their own solutions. They are also involved in the promotion of energy planning and legislative lobbying in this area. Municipalities that are active in energy planning do it on rather an ad-hoc basis, i.e. in obligatory municipal energy management documents they include objectives that they deem worthwhile. Next these objectives are approved by local authorities, which enables their enforcement. This facilitates negotiations with energy companies, as officials can refer to documents binding in their city or municipality. Sometimes measures such as local RES introduction anticipate the documents and are included in them after their implementation. It also occurs that the Assumptions to Municipal Plans for the Supply of Heat, Power and Gaseous Fuels are not updated at all, as are treated as a “dead document”. Instead, other, non-obligatory energy management documents are prepared for the municipality.

Despite numerous barriers and limitations, energy management in Polish municipalities exists. Its extent depends on the energy awareness of the relevant local authorities – from thermal insulation of individual buildings to reduce heating costs, through development of renewable energy to increase

municipal revenues, to the implementation of the guidelines for Sustainable Energy Action Plans by the cities that belong to the Covenant of Mayors.

Energy management in Polish municipalities is usually implemented independently of energy planning, as defined by the Energy Law Act of 10 April 1997. The Act obliges municipalities to prepare the Assumptions to Municipal Plans for the Supply of Heat, Power and Gaseous Fuels.

Leading local government organisations are aware of the role that proper energy planning and day-to-day energy management may play in local and regional development. They are interested in the joint development of satisfactory solutions and their promotion among their members. This is particularly important for propagating information about optimal energy planning and sustainable energy management among a large number of local authorities. This should be performed in cooperation with municipalities that are leaders in the field of energy planning, as they can act as role models in this area for other units of local administration.

# FINANCING FOR THE THERMAL MODERNISATION OF PUBLIC BUILDINGS

## – WHERE DO WE STAND WITH ESCOS?

JANUSZ MAZUR  
JOANNA TOBOREK-MAZUR

Where exactly do we stand with ESCOs in Poland? Two years have passed since the first meeting of the informal ESCO Club, organised in January 2011 in the headquarters of the Przedsiębiorstwo Oszczędzania Energii ESCO, Ltd. in Kraków (POE ESCO – energy saving company). Was this a turning point in the slow development of this form of energy efficiency measures? At that time many people believed that the Polish ESCO market was comprised of several active companies and a few more for which this form of operation was close but which either did not apply it or did so only sporadically. What has changed and what remains to be done?

At the beginning of 2011, the demand side included: the public sector, preferring EU and environmental subsidies to ESCO investments, the national defence sector, disappointed by many badly prepared projects implemented at the turn of the century, the residential sector, content with the thermal modernisation premium, and the industrial sector, about which we do not know much except for the fact that the people responsible for energy matters in both production and service companies were blocking possible investment.

The Minister of Finance, notorious for his unfavourable attitude towards energy-efficiency, nearly killed the market with his Regulation on the detailed classification of debt instruments included in the state public debt and in State Treasury debts. Today the demand side looks much better, but this will be elaborated on later in the article. Most probably the supply market in January 2011 looked equally poor. There were several

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Since 2005 President of the Board of the Przedsiębiorstwo Oszczędzania Energii ESCO, Ltd. in Kraków (POE ESCO – an energy saving company). The company was established in 2000 by the Miejskie Przedsiębiorstwo Energetyki Ciepłej, plc in Kraków (MPEC – municipal heat energy company), upon the initiative of the World Bank. Earlier worked as a manager at the Office for Strategy and Promotion in MPEC – the sole proprietor of POE ESCO. He has cooperated with numerous international institutions, e.g.: The World Bank, GEF, EBRD, US TDA, US AID, US Department of Energy, EU Joint Research Center. He authored the sections on ESCOs in Poland in: *ESCOs Around the World. Lessons learned in 49 Countries*, S. Hansen, P. Langlois, P. Bertoldi, The Fairmont Press Inc, USA 2009, and *World ESCO Outlook*, S. J. Hansen, The Fairmont Press Inc, USA 2012. Awarded the Golden Badge of Merit by the Polish District Heating Chamber of Commerce. He is one of the initiators of the ESCO Club.

Joanna Toborek-Mazur is a research worker at the University of Economics in Krakow, where she obtained her Ph.D. in economic sciences. Over the last few years she has been advising Polish ESCOs. She is also the author and co-author of a number (over 70) of various papers: books, articles and others, addressed for students, scientists and business. She is an independent consultant for the Ministry of Finance, companies and various institutions. Her scientist activities are focused on organization and managing of combined structures, mergers, amalgamations, acquisitions and such. She is an expert in tax and accounting issues.

international players (Siemens, Dalkia, Cofely), Krakow's POE ESCO and various private companies that implemented selected projects under the ESCO model (DZT, Hydrochem, Promar, Ryszard Śnieżyk). There were also companies that promoted themselves as ESCOs but had never implemented any projects in this form, lacking the necessary potential and knowledge. Today the number of ESCOs is several times higher – there are newly established companies, such as Suncash from Krakow or AESCO from Warsaw and companies that have supplemented their activities with ESCO projects, e.g. Introbat from Chorzów.

How much have the market and conditions for ESCO projects changed since January 2011? Is it justifiable to claim that the situation has only slightly improved and that the government has not done its share?

In 2011 the Bellona Poland Foundation conducted research aimed at the identification of barriers to ESCO development in Poland (a wider version of the report from the research was prepared by the Institute of Environmental Economics in 2012).

The main barriers identified during the research are as follows: strong competition from EU funds, the lack of financial instruments dedicated to ESCOs (loans, guarantees), lack of off-balance financing instruments (factoring and forfaiting), the lack of legal solutions in the areas of public procurement law, balance law and energy law. It should be stressed that these barriers still exist.

Between demand and supply there are technical and economic conditions that are decisive for the economic viability of an investment. It is important to verify whether the thermal modernisation of public buildings pays back in the medium term, i.e. 5–8 years. This depends on numerous factors: from the initial state of the buildings and heating costs, to profit expectations. If a school is heated with an old gas boiler house, or even better, an old oil boiler house, and a district heating network based on high-efficiency co-generation is available in the vicinity, while the managers of the building understand that thermal modernisation consists of improvements that allow for rational energy consumption reduction and do not treat it as an opportunity for the building's extensive renovation (window replacement, insulation of cellars against humidity), then it is possible to prepare a self-financing programme. In other cases thermal renovation measures have to be co-financed by a subsidy or considerable financial input on the investor's part. Although the second solution can be pursued within the ESCO scheme (there



remains the question as to whether this really necessitates companies with substantial investment capital), subsidies will win this unfair competition supported by the government. State authorities do little to change this unfavourable situation, as if energy efficiency and climate protection should be addressed only by environmentalists and ESCOs and not the government.

So is it justified to claim that the situation is improving? Let us return to the aforementioned analysis of 2011. Its results were presented at a press conference in May 2011 and submitted to the Ministry of Economy, the Ministry of Finance, the Ministry of Regional Development, the National Fund for Environmental Protection and Water Management, the Polish National Energy Conservation Agency and the European Bank for Reconstruction and Development (EBRD). Shortly afterwards, the August Forum Energy – Effect – Environment was fully dedicated to ESCO problems in Poland (the author presented the situation of ESCOs on the basis of a Krakow company, while Grzegorz Peszko, from EBRD, talked about a bank's support for this market in Bulgaria). The long discussion following the presentations marked the beginning of a new approach to the problem, while the high quality of the debate was guaranteed by the involvement of the National Fund for Environmental Protection and Water Management. ESCO development was also supported by Professor Krzysztof Żmijewski (each of Energy Efficiency Forums included a section on ESCOs), Andrzej Kassenberg from the Institute for Sustainable Development and last but not least the President of the Polish National Energy Conservation Agency, Zbigniew Szpak.

On 21<sup>st</sup> November 2011, the National Fund for Environmental Protection and Water Management hosted a debate on the Second National Energy Efficiency Action Plan. Among the participants were representatives of the Ministry of Economy, the Polish



National Energy Conservation Agency, ESCOs, the Institute of Environmental Economics and many other NGOs. The provisions agreed during the meeting followed the expectations of the ESCO sector. Soon this document was adopted by the government.

The next meeting of the ESCO Club took place in January 2012 and was hosted by the Polish National Energy Conservation Agency. It contributed to the multilevel research conducted among ESCOs by the Institute of Environmental Economics for EBRD. A conference, initiated by Tomasz Terlecki from the European Climate Foundation and organised in the German Embassy, constituted the next event in the ESCO debate. In May, Andrzej Kassenberg presented the problems of Polish ESCOs in Brussels, during a seminar in the Permanent Representation of the Republic of Poland to the European Union. EBRD, the Polish National Energy Conservation Agency and the National Fund for Environmental Protection and Water Management discussed various products for Polish ESCOs.

The involvement of Małgorzata Skucha, the current President of the National Fund for Environmental Protection and Water Management, was an important development. The next meeting of the ESCO Club (in September), co-organised by the National Fund at its premises, gathered a large number of ESCO representatives. The discussion focussed on ESCO needs. The Ministry of Regional Development and the National Fund promised that programmes dedicated to ESCOs would be included in the next financial perspective (2014–2020). The Fund has already started to prepare such a programme, as ESCOs have recently received materials for consultation.

Is it, therefore, justified to say: *if the situation is so good, why is it so bad?*

The situation is bad, as nothing has changed so far, except possibly for the adoption of the highly complicated Energy Efficiency Act, which will be of little help for the ESCO sector. The impact on ESCOs and their customers of the otherwise useful Act on the reduction of some administrative burdens in the economy will be negative. But markets always look for new opportunities. These can be found in the Act on public private partnership and the criticised Public Procurement Law.

The Silesian municipality of Radzionków has become a real role model in this respect. Although the tender procedure for thermal modernisation of five education units under the PPP scheme, concluded in 2011, was far from perfect, the idea is well worth being

applied by other municipalities. If the municipality had not decided to provide a sizable share, nearly 10 million PLN, from its budget, for this project, energy savings alone would not have been sufficient to finance the necessary work. The idea is gaining popularity – in July 2012 the municipality of Sosnowiec announced a tender for the thermal renovation of 80 buildings, while Bytom has recently done the same for 17 buildings. Despite the fact that five contractors joined this tender procedure under the PPP model (worth over 20 million PLN), preliminary estimates show that the expectations of the contracting party with regard to thermal modernisation works considerably exceed the savings that could be generated in these buildings, even over 15 years. A similarly large tender procedure is expected in Wrocław. All this proves that the indices introduced by the Minister of Finance can be dealt with and that it is possible to take action without waiting for subsidies.

The abovementioned local authorities should be praised for their courage and active stance. We should be happy that they are initiating such actions. But how many companies are able to meet the expectations of the contracting parties? One, maybe two, the remaining ones have to enter into complicated consortia. Is our private capital insufficient? Or maybe the banking system is too conservative? Probably the latter is true, as more and more often ESCOs are supported by private investment funds. Their capital is more expensive, but available.

The conclusions are not too optimistic. If the Polish government does not do its share, nothing will change in the next EU financial perspective – it will still be impossible to implement thermal modernisation projects under the Energy Performance Contracting model (i.e. a full ESCO with saving guarantees). This will be disadvantageous for both the public sector (that otherwise could modernise its resources without increasing its debt) and private companies, which during the ongoing crisis in the construction market desperately need new contracts. The thermal modernisation needs of public buildings are immense and the market could accommodate hundreds of ESCOs, not a couple of dozen. This, however, requires proper conditions that will enable such projects. Local authorities can be easily convinced about the facts and the relation between the scope of thermal modernisation and payback rates – they have already modernised numerous buildings. It is a pity that the central government is so rich that it does not have to insulate its buildings and continues warming the atmosphere. Has anyone heard about a tender for the thermal modernisation of buildings administered by the central government?

# SUBSIDIES FROM THE NATIONAL FUND FOR ENVIRONMENTAL PROTECTION AND WATER MANAGEMENT FOR LOW ENERGY BUILDINGS

MAŁGORZATA KOJS

## MAŁGORZATA KOJS, MA

Analyst, graduated from the International and Political Studies Faculty of the Jagiellonian University. Worked as an intern at the Polish Permanent Mission to the United Nations in New York and in the European Parliament in Brussels, dealing with fuel poverty among other things. Currently employed in the Institute of Environmental Economics, implementing projects in energy efficiency.

In 2012 the National Fund for Environmental Protection and Water Management prepared two programmes that support the development of low energy buildings in Poland. They will be launched in 2013. The first one targets natural persons that plan to construct a house or purchase a flat from a developer or a housing association. Depending on the energy efficiency standard, the Fund offers a one-time subsidy to a loan, amounting to PLN 30,000–50,000 gross for single-family houses and PLN 11,000–16,000 gross for apartments in multi-family buildings. The payments will be transferred when the Fund receives documentation confirming the required energy-efficiency standard of the building. The programme has already been approved by the Supervisory Board of the Fund. Offers of loans with the subsidy should be introduced in the first quarter of 2013\*. The second programme, LEMUR, targets public units and is still awaiting approval by the Supervisory Board. It is, however, highly probable that it will be also launched in 2013. The Fund is analysing possible forms of support within the programme. Two main options are being considered: the co-financing of up to 70% of eligible expenses connected to the construction design,

\* <http://www.nfosigw.gov.pl/o-nfosigw/aktualnosci/art,384.html>

depending on the reduction of the building's demand for usable energy and the co-financing of construction costs as a refund for incurred eligible expenses, depending on the reduction of the building's demand for usable energy for heating and ventilation (Eu hv):

- reduction of Eu hv by 20–40% – co-financing of PLN 300/m<sup>2</sup>,
- reduction of Eu hv by 40–60% – co-financing of PLN 500/m<sup>2</sup>,
- reduction of Eu hv by over 60% – co-financing of PLN 700/m<sup>2</sup>.

The Fund is also preparing detailed technical criteria that have to be fulfilled by these buildings. Each programme has a budget of PLN 300 million.

Programme	Programme of subsidies to loans for the construction of energy-efficient houses and apartments for natural persons	Programme of co-financing for the construction of energy-efficient public buildings
Budget	PLN 300 million	PLN 300 million
Implementation period	2013–2018	2013–2020
Type of co-financing	One-time subsidies to loans	Co-financing for construction
Level of co-financing	<ul style="list-style-type: none"> <li>• single-family houses <ul style="list-style-type: none"> <li>a) NF40 standard <ul style="list-style-type: none"> <li>– Eu hv 40 kWh/(m<sup>2</sup>·year)</li> <li>– subsidy PLN 30,000 gross;</li> </ul> </li> <li>b) NF15 standard <ul style="list-style-type: none"> <li>– Eu hv 15 kWh/(m<sup>2</sup>·year)</li> <li>– subsidy PLN 50,000 gross;</li> </ul> </li> </ul> </li> <li>• flats in multi-family buildings: <ul style="list-style-type: none"> <li>c) NF40 standard <ul style="list-style-type: none"> <li>– Eu hv 40 kWh/(m<sup>2</sup>·year)</li> <li>– subsidy PLN 11,000 gross;</li> </ul> </li> <li>d) NF15 standard <ul style="list-style-type: none"> <li>– Eu hv 15 kWh/(m<sup>2</sup>·year)</li> <li>– subsidy PLN 16,000 gross.</li> </ul> </li> </ul> </li> </ul>	<p>The exact form of support has not been defined yet. The Fund is considering:</p> <ul style="list-style-type: none"> <li>• co-financing of up to 70% of eligible expenses connected with the construction design, depending on the reduction of the building's demand for usable energy;</li> <li>• co-financing of construction costs as a refund of incurred eligible expenses, depending on the reduction of the building's demand for usable energy for heating and ventilation (Eu hv): <ul style="list-style-type: none"> <li>– reduction of Eu hv by 20–40% <ul style="list-style-type: none"> <li>– co-financing of PLN 300/m<sup>2</sup>,</li> </ul> </li> <li>– reduction of Eu hv by 40–60% <ul style="list-style-type: none"> <li>– co-financing of PLN 500/m<sup>2</sup>,</li> </ul> </li> <li>– reduction of Eu hv by over 60% <ul style="list-style-type: none"> <li>– co-financing of PLN 700/m<sup>2</sup>.</li> </ul> </li> </ul> </li> </ul>

Polish legislation does not specify the technical requirements for nearly zero energy buildings. Pursuant to Directive 2010/31/EU, such a definition should be included in the National Energy Efficiency Action Plan for Poland. One of the aims of this document is to increase the number of nearly zero

energy buildings. The Plan will be prepared by the Ministry of Transport, Construction and Maritime Economy. The aforementioned directive states that from 1 January 2019 all new public buildings will have to display low energy demand. From 2021 this requirement will be extended to other types of buildings. The National Fund hopes that the technical requirements that will have to be fulfilled under its two new programmes will help prepare the market for these changes.

Some people have accused the Fund of preparing a programme that mainly supports banks and affluent people who can afford to construct an energy-efficient house, as the subsidies for natural persons are available for those who take out a loan. The construction of a low energy house requires higher investment outlays during design and execution. The subsidy is insufficient to cover these additional expenses. Therefore, the programme will only be attractive for people who have already been planning to construct a house with high energy performance or have been considering this. The Fund replies that this solution results from the fact that it has insufficient capacity to deal with all the applications and that bank involvement will allow it to reach a greater number of people. The Fund hopes also that the programmes will act as an educational measure, stimulating the construction of energy efficient houses. Apart from energy saving and CO<sub>2</sub> emission reduction, the programmes will undoubtedly promote new standards among architects, construction companies and final clients, which will stimulate the development of the Polish market for energy efficient materials. The programme for natural persons alone will enable subsidies for 12 thousand energy efficient houses and apartments.

Subsidised credits will be available in: Bank Polskiej Spółdzielczości, SGB-Bank, Bank Ochrony Środowiska, Bank Zachodni WBK, Getin Noble Bank, Nordea Bank Polska and Deutsche Bank. On its website the National Fund presents detailed technical requirements and a good practice guide for beneficiaries, designers and construction companies.

# A MEDIA CAMPAIGN PROMOTING ENERGY EFFICIENCY IN BUILDINGS – A POSSIBILITY OR A NECESSITY?

MAŁGORZATA KOJS

The average energy consumption ratio per 1 m<sup>2</sup> is very high in Polish buildings – in 2006 it amounted to 170 kWh/m<sup>2</sup>, while in Norway, where the climate is much harsher, it was slightly over 110 kWh/m<sup>2</sup>\*. New buildings constructed in Poland are also among the most energy-intensive in the whole EU. Demand for heat energy for heating new houses constructed in Poland amounts to 90–120 kWh/m<sup>2</sup>; in Denmark it is much lower – 22–55 kWh/m<sup>2</sup>\*. At the same time, only slightly over 18% of Poles are aware that heating consumes the largest part of their energy costs\*. Public opinion research shows that one of the main barriers hindering the development of energy-efficient buildings in Poland is insufficient awareness in Polish society, i.e. a lack of information about energy consumption, a lack of information about the benefits of energy efficiency improvement investments and a lack of information about possible sources of financing for such investments\*.

The majority of Poles associate energy saving with turning off lights. Integrated thermal modernisation measures can reduce energy consumption in a building even by 70–90%\*.

One of the measures that is meant to help increase Poles' awareness of energy saving issues is the conducting of education and information campaigns envisaged in the National

*\* Report Energy Efficiency Indicators in Europe*

*\* Report Szóste paliwo – Polacy o oszczędzaniu energii*

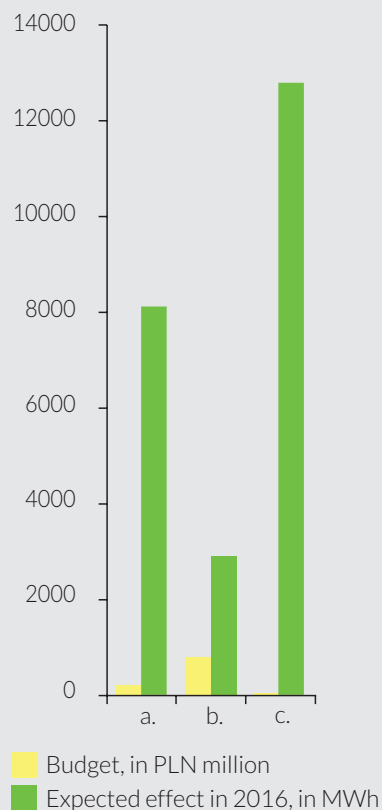
*\* Report Oszczędność energii w opinii Polaków*

*\* Ministry of Economy, Second National Energy Efficiency Action Plan for Poland 2011, Warsaw, April 2012*

*\* Report Szóste paliwo – Polacy o oszczędzaniu energii*

\* Ministry of Economy, Second National Energy Efficiency Action Plan for Poland 2011, Warsaw, April 2012

## Second National Energy Efficiency Action Plan for Poland 2011



- a. Thermal Modernisation Fund
- b. Supplementary financing of investment measures aiming at energy savings or at increasing energy efficiency of businesses
- c. Information and education campaign

Graph 21

Energy Efficiency Action Plan (NEEAP). Targeted campaigns, organised and coordinated by the Ministry of Economy and the Ministry of Transport, Construction and Maritime Economy, are planned for 2012–2016, with support from the state budget at the level of PLN 2 million annually\*. The main topics to be covered in the campaigns include: the financing of energy efficient investments within the ESCO scheme, a system of white certificates and nearly zero energy buildings. Regrettably, 2012 budget cuts also affected energy efficiency improvement measures and only PLN 600 thousand was spent that year on the campaigns instead of the promised PLN 2 million. We are yet to see what happens with the campaign budget in 2013 and subsequent years. We do know, however, that according to the NEEAP, the campaigns should stimulate Poles to save as much as 12,793 GWh (around 1,1 Mtoe). Due to the budget cuts this may prove unfeasible.

Another important question is whether it is at all possible to achieve such a significant effect by means of an educational media campaign. The expected savings from the introduction of the Thermal Modernisation and Renovation Fund (i.e. hard investments measures) amount in 2016 to 8,121 GWh. Support from the public financial resources for the Fund will amount to PLN 200 million annually, which is 100 times more than for the media campaign. One may therefore wonder whether the predicted effects of the media campaign are not substantially overestimated (when the NEEAP was being prepared, its authors did not worry about measuring and verifying the results of the envisaged measures). This question can be indirectly answered by comparing the effects of campaigns already implemented in other European countries. Unfortunately, despite a large number of educational and informational campaigns about energy efficiency, it is difficult to find projects for which the effects have been thoroughly evaluated and assessed, in particular in GWh.



## FIN 20 ENERGY EFFICIENT HOME CAMPAIGN – EDUCATION CAMPAIGN CONDUCTED IN FINLAND

The aim of this campaign was to increase the share of buildings with low energy consumption within newly constructed single-family houses, from 5% in 2005 to 25% in 2010. The campaign featured a special internet portal, printed brochures and a handbook for final users. The research conducted in 2007 shows that as many as 48% of people planning to construct a house were familiar with the campaign, 26% visited the website and nearly 40% declared willingness to construct a low energy house. After this initial success the campaign was prolonged and is still being implemented. Its budget amounts to EUR 20,000 annually, except for last year, when it was increased to EUR 50,000. Unfortunately knowledge about the campaign and stated willingness to construct an energy-efficient building do not translate into tangible effects in low energy consumption. It is expected that in 2016 the savings resulting from the campaign will amount to slightly below 29 GWh.

One particularly successful campaign in raising social awareness of energy efficiency issues was a campaign conducted in Finland in 2005–2008 by the consulting company Motiva, in co-operation with the Ministry of Environment, Ministry of Labour and Ministry of Economy, associations and industry\*. In its evaluation it was estimated that in 2016 the resulting savings will amount to 29 GWh. If we assume that the results of the Finnish campaign can serve as a point of reference, then the budget of the informational and educational campaigns planned in Poland should be higher by at least six zeros in order to allow the expected result of 12 793 GWh of savings. Prior to the campaign Finns already regarded energy efficiency as a significant issue. In Poland this is not the case and energy efficiency occupies a different position in the awareness of an average citizen. This makes achieving positive results even harder. The challenges faced by prospective authors of these campaigns in Poland are much more demanding than in Finland..

Poland lacks informational campaigns that would be developed jointly by various ministries and implemented within the promotion of various measures (funds, financial instruments)

\* The Evaluation of Energy Behavioural Change Programmes (Behave)

aimed at energy efficiency improvement. A well-prepared campaign could significantly increase the results of these mechanisms.

A successful campaign cannot be limited to information on various solutions aimed at electricity saving. It should also contain elements that enhance the value of energy efficiency as such, so that consumers actually apply the information presented in the campaign. It is also important to make people more aware that energy consumption goes beyond electricity and includes heating and transport.

The campaign by the Ministry of Environment “Wyłączamy prąd, włączamy oszczędzanie” [Turn off power, turn on savings], conducted in 2012, matches the objectives on the NEEAP. However, due to that fact that the activities implemented by various ministries are not integrated, it will not be taken into account during NEEAP evaluation. It is worth mentioning that Poland will have submit information to the EU on the implementation of the objectives included in the NEEAP, which makes the whole issue more problematic. The deadline is approaching – we have only three years left until 2016.

In its latest report, the European Court of Auditors describes the results of its control of energy efficiency projects co-financed with EU funds. It clearly shows that the analysed projects lacked rational economic viability objectives\*. The pay-back period for energy efficiency investments in public buildings frequently amounted to 100 or even 150 years, which is longer than the buildings’ life span. If Polish ministries want to fulfil their commitments they should urgently start working on a campaign that will not only promote energy efficiency improvement measures, equally at the design stage, but will also include measurable effects.

The Polish government has allocated PLN 20 million for a campaign promoting nuclear energy. It is high time that energy efficiency is treated equally seriously.

\* [http://energetyka.wnp.pl/zlewydawanie-srodkowue-przeznaczanych-naoprawe-efektywnoscienergetycznej,187884\\_1\\_0\\_0.html](http://energetyka.wnp.pl/zlewydawanie-srodkowue-przeznaczanych-naoprawe-efektywnoscienergetycznej,187884_1_0_0.html)

# THE INSTITUTE OF ENVIRONMENTAL ECONOMICS



The Institute of Environmental Economics is a non-governmental organisation specialising in environmental protection, energy efficiency and climate policy. Its current activities focus on issues connected with the introduction of new financial measures (e.g. the development of the ESCO market), energy planning, the Polish system of white certificates, virtual power plants, group purchases of energy and nearly zero energy buildings.

More information about the Institute available at:

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