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COMMUNITY BASED SOCIAL MARKETING FOR IMPLEMENTATION OF ENERGY SAVING TARGETS AT LOCAL LEVEL

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Abstract
Energy saving and greenhouse gas (GHG) emission reduction policies at local level need to be investigated and new tools for climate change mitigation are necessary seeking to achieve GHG emission targets in Lithuania. Most Lithuanian municipalities have signed Covenant of Mayors and have prepared local energy action plans. However, all these plans include just energy saving measures on supply side and renovation of buildings. Nevertheless, the significant energy savings and GHG emission reductions can be achieved through behavioural changes. The aim of the paper is to apply community based social marketing approach in assessment of achievable energy saving and GHG emission reduction targets set by local energy action plans. The paper presents the results of case study implemented in Kaunas region municipality. The case study was conducted by creating focus groups and applying two scenarios: baseline or doing nothing and climate change mitigation scenario including intervention measures. The results of case study revealed that the total energy consumption reduction target set in Sustainable energy development strategy of Kaunas region county - 11% - can be achieved by combining results of energy consumption reduction in both focus groups. The survey conducted after study finalization revealed that respondents were provided with a lot of additional knowledge during the study and achieved real money savings. The major barriers of energy savings in households are related with the lack of information on energy savings and GHG emission reduction.

Keywords: community based social marketing, local energy plans, energy savings, GHG emission reductions

JEL Classification: Q41, Q5, Q58, R21, R58

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Introduction

Individual behaviour is the cause of a significant number of environmental problems, yet control of human behaviour has been largely absent from environmental legislation, which generally targets industrial sources of environmental harm. It is estimated that in the United States alone, individuals account for 32% of the United States' annual greenhouse gas emissions, summing up to approximately 8% of global greenhouse gas emissions (Kennedy, 2010). As Vandenbergh and Steinemann (2007) argue, small shifts in individual behaviour will result in emission reductions that will exceed the total emissions of whole industries, as well as other countries and even continents. Legislation can also directly address some of the problems caused by personal, private-sphere, environmentally significant behaviour by the restriction or encouragement of certain behaviours however legislation relies upon only some of the drivers of behaviour (Johnson, 2009).There are also non-legal challenges in the implementation of law. These include the need to ensure that citizens know their obligations and have the means to comply (Petkeviciute and Streimikiene, 2014). It is also expensive to design and enforce regulatory programs against individuals when compared to industry groups and corporations.

There are traditional methods such as advertising and public relations applied for behavioural changes in local communities. However, the innovative approaches designed specifically to focus on behaviour change have been recently developed and widely applied. The innovative tool such as **community-based social marketing** (CBSM) focuses on identifying and overcoming the barriers that limit reaching traditional awareness-raising campaigns. CBSM acknowledges the necessity of speaking to the interests, concerns and motivations of the individual as a member of a community, and the importance of using community networks to drive action and lasting behaviour change. The community-based social marketing movement advocates a tightly structured program involving removal of barriers to change, attacking multiple drivers of environmental behaviour through the use of behaviour change tools, and doing so at the community level using direct personal contact (McKenzie-Mohr and Smith, 1999).

The aim of the paper is to review community based social marketing approach and present the results of an empirical study conducted in Lithuania, focused on behavioural changes in households when implementing local energy plans.

The main research objectives are:

- to analyze the community based social marketing approach in context of behavioural changes in energy consumption;
- to analyze local energy plans and their implementation issues in Lithuania;
- to present the results of empirical study conducted in local community and applied community based social marketing approach in implementing targets set in local energy plan
- to develop policy recommendations.

The first chapter of the paper presents community based social marketing approach and emphasizes its strengths in application for behavioural changes in energy sector. The second chapter presents overview of local energy plans in Lithuania and following chapters briefly introduce the methodology and highlights results of the case study conducted in

selected Lithuanian municipality. Finally, conclusions are developed addressing the main findings and policy implications of conducted study.

1. Community based social marketing and drivers of behavioural changes in energy consumption

Community-based social marketing (CBSM) is a social-science-based alternative approach to behaviour change (McKenzie-Mohr and Smith, 1999). It focuses on the identification of barriers to participation and fosters the development of locally-defined strategies to overcome those barriers. CBSM is most successful in practice when existing networks of community influencers and leaders are engaged to help incorporate the concerns and interests of the community the program is designed to serve. These leaders, then, are empowered (and in many cases hired) to be the local champions of the program messages and prescribed actions (Mullaly, 1998).

Community Based Social Marketing (CBSM) is a framework that is increasingly being used by organisations and governments to change behaviour and to develop GHG emission reduction programmes in local communities (Sweeney, 2009). The CBSM framework is a sequential process that identifies behaviour to change, and then requires research to uncover the barriers and benefits related to the new behaviours and the existing behaviours. It is only then that tools of change are matched to overcome the barriers, and amplify the benefits of the more sustainable behaviour being promoted. In this, it is important to note that barriers lie with specific activities that make up behaviours. It is also important to note that barriers are not homogenous to groups, so it is important to segment the population into target groups of like-individuals (for example, by socio-demographic, or gender). Once tools are identified, a strategy is matched to the tools. CBSM places great focus on the extensive research work associated to uncover barriers to behaviour change, as well as on the sequential process that places the design of the strategy (for example advertisements, home audits, workshops) as the final piece of the puzzle before piloting the strategy (Kollmuss and Agyeman, 2002). Community-based social marketing promotes the strategic use of community-based direct initiatives, rather than mass media advertising alone. The development of community-based social marketing was born out of a desire to improve the effectiveness of environmental campaigns which relied heavily upon information-based advertising. Kollmuss and Agyeman (2002) note that community-based social marketing has been successful because it can transcend ―the gap between knowledge and action that has characterized many local environmental and sustainability projects to date.

There are several important studies dealing with community based social marketing approach and assessment of the main drivers of behavioural changes in energy consumption of households (Kaiser and Schultz, 2009; Edgerton, McKechnie and Dunleavy, 2009). A paper by Kennedy (2010) explores how environmental regulation may be improved through the use of community-based social marketing techniques. It is argued by the author that more effective environmental laws may be achieved using strategies that integrate regulation with community-based social marketing. Case studies where community-based social marketing techniques have been successfully used are examined, and methods for employing community-based social marketing tools to support environmental regulation are proposed (Kennedy, 2010). Across a range of indicators, environmental concerns of adolescents show increases during the early 1990s and declines across the remainder of the three decades. Declining trends in reports of personal responsibility for the environment,

conservation behaviours, and the belief that resources are scarce are particularly noteworthy. Across all years, findings reveal that youth tended to assign responsibility for the environment to the government and consumers rather than accepting personal responsibility. Recent declines in environmental concerns for this nationally representative sample of youth signal the need for a renewed focus on young people's views and call for better environmental education and governmental leadership (Wray-Lake, Flanagan and Osgood, 2010).

Another study (Niemeyer, 2010) found constraining variables that may impinge on adopting energy-efficient practices, materials, equipment and technology in households. Constraint variables include knowledge of existing energy-efficient practices and technology; economic constraints (household income, cost as a problem, financial need and existing energy costs); obstacles to making changes (lack of information, assistance, time, cooperation, trained persons and the condition of home); and demographic variables (age, education level and urban/rural). Attitude and belief constraints include measures of felt responsibility for energy use-related actions that impact the natural resources and environment, and measures of concern. These constraints may impinge on or contribute to making energy-efficient changes in residential household.

Samples of drivers and walkers are examined to understand factors influencing the decision to walk (Walton and Sunseri, 2010). These drivers exhibit a break in car dependency because they use public transport. Results show the convenience of a car park induces park-and-ride demand. Weather influences decisions to walk. However, walking is not impeded by factors such as distance, fear of crime, carriage of goods or concern for time (Walton and Sunseri, 2010). Another paper (Hunecke et al, 2010) analysed the opportunities and limits of reducing the ecological impact of mobility behaviour on the basis of an attitude-based target group approach. The CBSM approach is very useful then developing local sustainable energy development strategies or local energy action plans.

2. Local energy action plans in Lithuania

Policy implementation at the local level allows for greater flexibility to meet local needs. Local governments' knowledge of their constituents' needs can help frame the local discussion surrounding clean energy in a way that demonstrates the potential benefits. Citizens are also more likely to interact directly with their local government, providing greater opportunities for addressing local issues (Bushe, 2010). Decentralized energy and climate change mitigation policy allows for greater experimentation as each government designs the policy to best fit the locality's unique context (Lutsey and Sperling, 2008). Policy implementation at the local level can provide insight into the effectiveness of innovative policies and unique policy design components that can be adopted by other governments, at the local or state, levels (Lindseth, 2004). Framing the energy saving and GHG emission reduction issue as a local issue increases citizen involvement in the clean energy discussion because they have the ability to be more directly involved in the local decision-making process (Pearce, Greene, 2009).

However there are some problems in developing local energy plans as actors in the municipal administration often regarded the energy system as only consisting of the supply function. The domination of the supply side in the energy system was, for example, indicated by the fact that most energy issues on the municipal council agenda were related

to energy supply. Energy conservation and behaviour were less frequently on the agenda. Energy issues discussed in municipal council included planned large investments in energy production, expansion of the district heating system, and environmental issues related to discharge standards. One explanation of this focus may be institutional. The local energy company was legally obliged, for example, to seek municipal council approval of major investments in energy production. When it came to energy related bills in the municipal council, most of these also concerned energy supply. The domination of the energy supply side was revealed in national energy strategies and by the local energy plans in Lithuania (Streimikiene, Balezentis and Kriksciukaitiene, 2012). Taking into account the recent EU policies promoting energy efficiency the demand side is also being covered in local energy plans prepared by Lithuanian municipalities.

Lithuania is divided into **10 counties** and further divided into a total of **60 municipalities**. There are two sorts of municipalities in Lithuania: cities and districts. There are no differences between municipalities on regulation powers established by the Law on Local Self-government. There are fourteen independent functions delegated to municipalities by the law and among them there are no functions related to sustainable energy development or climate change mitigation issues. There are several assigned functions of municipalities related with sustainable energy development and climate change mitigation issues: preparation of programs related to the development of housing, organization of heating and water supply, as well as waste water collecting and treatment; development of municipal waste management, maintenance of municipal buildings and roads of local significance, implementation of regional development programs etc.

In 1997 because of restructuring of vertically integrated state monopoly in energy sector the district heating systems were transferred to the jurisdiction of municipalities. Now Lithuanian municipalities play important role in heat sector and have powers to introduce renewable and increase energy efficiency in this sector (Streimikiene and Balezentiene, 2014).

Lithuanian municipalities have opportunities in local energy plans to include sustainable energy projects related to renovation of public buildings and development of energy efficient housing, development of waste collection and management systems and use of municipal waste for energy production, use of waste water treatment for gasification of syngas, which can then be burned to produce electricity, renovation and modernization of heating system and use of renewables for heating. As municipalities play important role in territorial planning and management of road infrastructure in the territory of municipality they are able to reduce GHG emission by improving roads (Streimikiene, Balezentis and Kriksciukaitiene, 2012).

The municipalities have powers in preparation of long –term strategic development plans, detailed master plans and short-term strategic activities plans. At present there are several planning streams in Lithuania which are not very well coordinated between each other. This creates additional problems for implementation of national climate change and energy policies on local level. The local climate change mitigation and sustainable energy plans need to be prepared taking into account local strategic development plans or can be a part of these long-term strategic development plans. This would help municipality to find financial resources including EU structural funds and to allocate them more efficiently taking into account all priorities of municipality's strategic development (Streimikiene, Balezentis and Kriksciukaitiene, 2012).

Up to now 9 municipalities had signed EU Mayors pact (Anyksciai, Kaunas, Kaunas region, Panevezys, Pakruojis, Silale, Silute, Vilkaviskis and Akmene). The municipalities had obliged themselves at reducing their GHG emissions by 20% till 2020. The municipalities were actively investing in conversion of the local boiler-houses to renewable sources of energy, renovation and modernization of the heating systems in public buildings even before joining the Mayors Pact. In Kaunas region municipality CBSM approach was applied in developing local sustainable energy plan.

3. Empirical study of assessment of energy saving potential in preparation of local energy action plans and CBSM

3.1 Methodology

The first step in developing local sustainable energy development plan should be the selection of the main themes relevant to climate change mitigation at local level. The targets based on EU and Lithuanian policies the targets for Kaunas Region County were selected. The main indicator to address sustainable energy development target for 2020 was: reduction of energy consumption by 11% comparing with baseline scenario. Increase in energy efficiency and use of renewable energy source are the main ways to reduce greenhouse gas (GHG) emissions and the main targets of EU energy and climate change mitigation policy.

The case study was conducted by applying two scenarios: baseline or doing nothing and climate change mitigation scenario including intervention measures. Four months 5 households in two focus groups were registering their monthly energy consumption (electricity, natural gas and motor fuels) based on records of meters and bills for automobile fuels. After information provision to focus groups during specially organized workshops and proposed measures for energy savings by curtailment behaviour two focus groups of households were registering they monthly energy consumption (electricity, natural gas and motor fuels) during four months again. Energy saving potential was evaluated by defining the difference between energy consumption during baseline and energy saving scenario. Also saved means due to energy savings were evaluated.

Focus groups consist of a small group of a targeted audience (in our case households living in individual houses and multi-flat buildings) and a moderator, who steers a discussion around the topic under consideration. Focus groups provide a cost and time effective method of interviewing larger groups of people. In many studies looking at reducing household energy consumption, it was found that focus groups provided rich data on the participants' own accounts of their behaviour and what could encourage changes in household consumption (Steg, 2008; Steg, Dreijerink and Abrahamse, 2006).

Two focus groups (households living in individual houses and households living in multi-flat buildings) consisting of 5 households representing different structure of the household (1, 2, 3, 4, 5 or more persons living together) were created after households surveys conducted in Kaunas region county for assessing the barriers of environmentally responsible consumption of energy saving in residential sector. Reasonably achievable energy saving potential in households was assessed in these groups and results were compared among focus groups. The information provision seminars were conducted for both focus groups and households were trained to save energy by implementing

behavioural changes in energy consumption. The qualitative and quantitative methods were applied for the assessment of energy saving potential in residential sector (Abrahamse, Vlek and Rotehengatter, 2007; Abrahamse, 2003).

The survey by means of focus group members was conducted in the end of workshop with the aim to obtain qualitative information on the main obstacles, barriers and challenges in implementing energy saving measures in households with the aim to disseminate this information between wider communities of Kaunas Region County and to ensure long-term effect of completed study. The recommendations to Kaunas region county administration was developed after finalizing the study results. The study was completed during 2013-2014 and financed this research was funded by a grant (No. MIP-004/2012) from the Research Council of Lithuania.

3.2 Results of case study

Energy saving potential in 2 focus groups was evaluated by applying information presented in Table no. 1. Seeking to assess total energy saving potential the energy savings achieved by specific energy carriers were converted to GJ by applying caloric values of specific energy carriers.

Table no. 1: Annual energy saving potential through interventions targeting behavioural changes in households

No	The structure of households	Automobile fuel savings						Natural gas savings		Electricity savings		Total GJ
		Gasoline		Diesel		LPG						
		L	GJ	l	GJ	l	GJ	m^3	GJ	kWh	GJ	
First focus group												
1	1 person	201	6.54	-	-	-	-	66	2.64	135	0.486	9.67
2	2 persons	-	-	18	0.54	-	-	105	4.20	105	0.378	5.12
3	3 persons	84	2.75	66	2.40	-	-	115	4.61	120	0.432	10.02
4	4 persons	-	-	288	5.24	-	-	36	1.44	165	0.54	7.22
5	5 persons and more	-	-	87	3.17	117	2.85	96	3.85	210	0.756	10.63
	Total	285	9.29	459	11.35	117	2.85	418	16.74	735	2.66	42.66
Second focus group												
1	1 person	-	-	81	2.94	-	-	6	0.24	90	0.324	3.50
2	2 persons	282	9.15	-	-	-	-	12	0.48	90	0.324	9.95
3	3 persons	-	-	132	4.77	-	-	12	0.48	180	0.648	5.90
4	4 persons	-	-	-	-	165	2.82	6	0.24	120	0.432	3.49
5	5 persons and more	138	4.47	195	7.05	-	-	12	0.48	150	0.540	12.54
	Total	420	13.62	408	14.76	165	2.82	48	1.92	630	2.268	35.38

As one can see from information provided in Table no 1 by comparing energy consumption according baseline and energy saving scenarios during 4 months the households in the first group were able to save 13.7% of electricity, 14% of natural gas, 10.4% of gasoline, 8.5% of diesel and 7.5% of liquefied petroleum gas. At the same the households of the second

focus group were able to reduce 7.2% of electricity consumption, 4% of natural gas consumption, 30% of gasoline consumption, 11.8% of diesel consumption and 16.5% of liquefied petroleum gas consumption.

As one can see from information in Table no. 1 one household in first focus group can save about 8.5 GJ energy per year. The highest energy saving potential or 4.6 GJ (54% of all energy savings achieved) lies in motor fuel savings. The household in first focus group can save 3.3 GJ of natural gas or 40% of total energy savings due to behavioural changes in energy consumption. Electricity savings allow achieving 0.66 GJ of energy savings or about 6% of total savings.

The one household in the second focus group can save about 7.15 GJ of energy. The highest energy saving potential or 6.2 GJ (80 of all saved energy) was achieved due to motor fuel savings. Due to natural gas savings the household in second focus group can save just 0.38 GJ of energy as uses natural gas just for cooking and do not have possibilities to regulate heating. Electricity savings in second groups provided for 0.45 GJ or 6% of energy savings.

By comparing energy savings achieved by 2 focus groups the savings achieved by the first focus groups were higher (42.66 GJ or 8.5 GJ per household) than in the second group (35.38 GJ or 7.1 GJ per household). However the comparison of energy consumption according baseline and climate change mitigation scenarios indicated that second focus group achieved higher energy consumption reductions (15.9%) comparing with the first focus group (8%).

The total energy consumption reduction target set in Sustainable energy development strategy of Kaunas region county – 11% was achieved by combining results of energy consumption reduction in both focus groups.

Based on energy savings and information provided in registration journals the annual saved means due to behavioural changes in energy consumption of households was In Table no. 2 annual savings of means due to behavioural changes in energy consumption in two focus groups are presented.

Table no. 2: Means saved due to behavioural changes in energy consumption, LTL

No	Households structure	Automobile fuel		Natural gas		Electricity		Total LTL
		Annual savings, l	Annually saved means, LTL	Annual savings, m3	Annually saved means LTL	Annual savings, kWh	Annually saved means LTL	
First focus group								
1	1 person	201	762	66	291.5	135	62.6	1116.1
2	2 persons	18	67.5	105	361.4	105	48.3	477.2
3	3 persons	150	575	115	380.2	120	55.2	1010.4
4	4 persons	288	1157,6	36	232,4	165	75,9	1465,9
5	5 persons and more	204	731,4	96	344,6	210	96,6	1172,6
	Total	777	3293.5	418	1610.1	735	338.6	5242.2

No	Households structure	Automobile fuel		Natural gas		Electricity		Total LTL
		Annual savings, l	Annually saved means, LTL	Annual savings, m3	Annually saved means LTL	Annual savings, kWh	Annually saved means LTL	
Second focus group								
1	1 person	81	319.1	6	48.1	90	41.4	408.9
5	2 persons	282	1068.8	12	64.1	90	41.4	1174.3
7	3 persons	132	520	12	64.1	180	82.8	666.9
9	4 persons	165	382.8	6	48.1	120	55.2	486.4
10	5 persons and more	333	1285.6	12	64.1	150	69.0	1418.7
	Total	995	3576.3	48	288.5	630	289.8	4155.2

As one can see from information provided in Table no. 2 one household in the first focus group can save more than 1000 LTL per year due to behavioural changes in energy consumption and achieved energy savings. The biggest amount of money (63%) can be saved by applying behavioural changes in cars usage.

At the same time one household in the second focus group can save more than 800 LTL per year due to implemented behavioural changes in energy consumption and achieved energy savings. More than 80% of all saved means are due to saving of motor fuels.

Conducted study revealed that in both focus groups the households have saved quite similar sums as the realized energy saving potential was similar in both groups. The first focus group saved about 20% more money comparing with the second group as achieved energy saving potential is higher in the first group because of the higher energy consumption levels.

In average one household in Lithuania can save about 900 LTL per year due to energy savings achieved by implementing behavioural changes in energy consumption. More than 700 LTL or more than 70% of all money savings can be achieved by behavioural changes in usage of private cars. 190 LTL can be saved because of natural gas savings and about 70 LTL can be saved annually by electricity savings in households.

The survey conducted after finalizing study revealed that respondent got a lot of additional knowledge during the study and achieved real money savings. The survey showed that households participated in the study increased their responsibility in climate change mitigation and acquired initiatives and knowledge to save energy and to provide input in implementing Sustainable development strategy targets set for energy savings to Kaunas region community.

The major barriers of energy savings in households are related with the lack of information on energy savings and GHG emission reduction. All participants of the study stated that they treat their participation in the study very positively and will share their knowledge and experience with the friends and neighbours. All participants of survey felt that they have contributed to implementation of Sustainable energy development strategy of Kaunas Region County. The most of respondents indicated (70%) that the most difficult was to

save electricity and natural gas. The savings of motor fuels was the easiest way to achieve energy savings and realize GHG emissions reduction potential in households.

Conclusions

The reasonably achievable energy saving potential in households was assessed by implementing interventions targeting behavioural changes in energy consumption. The community based social marketing approach was applied during preparation of local energy plan (Sustainable energy strategy of Kaunas Region County). Two (households living in private and multi-flat buildings) focus groups were created. The energy saving target was set for focus groups and competition between groups was initiated. The target-to reduce energy consumption by 11% was selected based on targets set in Sustainable energy strategy of Kaunas Region County.

The study was conducted by applying two scenarios: baseline or doing nothing and climate change mitigation scenario including intervention measures. Four months 5 households in two focus groups were registering their monthly energy consumption (electricity, natural gas and motor fuels) based on records of meters and bills for automobile fuels. After information provision to focus groups during specially organized workshops and proposed measures for energy savings by curtailment behaviour two focus groups of households were registering they monthly energy consumption (electricity, natural gas and motor fuels) during four months again. Energy saving potential was evaluated by defining the difference between energy consumption during baseline and energy saving scenario. Also saved means due to energy savings were evaluated.

The quantitative and qualitative methods for assessment of reasonably achievable energy saving potential was assessed for Kaunas region municipality. For implementation of energy saving scenario intervention measures aiming at behavioural changes were selected: information dissemination during the workshops and home visits; feed-back as the households energy consumption data was analyzed, energy savings were assessed in all households and both focus groups were and reported to them; the best performing focus group was defined based on achieved energy savings.

By comparing energy savings achieved by 2 focus groups the savings achieved by the first focus groups were higher (42.66 GJ or 8.5 GJ per household) than in the second group (35.38 GJ or 7.1 GJ per household). However the comparison of energy consumption according baseline and climate change mitigation scenarios indicated that second focus group achieved higher energy consumption reductions (15.9%) comparing with the first focus group (8%).

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The conducted study provided that energy saving and GHG emission reduction policies can be successfully implemented on local level. The community based social marketing is useful tool to enhance energy savings due to behavioural changes in local communities. This tool can supplement energy saving and GHG emission reduction policies targeting supply side and reveal huge energy saving and climate change mitigation potential on demand side.

References

Abrahamse, V., Vlek, L. Ch. and Rotehengatter, T., 2007. The effect of tailored information, goal setting, and tailored feedback on household energy use, energy-related behaviors, and behavioral antecedents. *Journal of Environmental Psychology,* 27(4), pp. 265-276.

Abrahamse, W., 2003. The effect of tailored information goal setting and feedback on households energy use. In: L. Hendrickx, W. Jager and L. Steg, eds. 2003. *Human decision making and environmental perception, Understanding and assisting human decision making in real-life settings*. Groningen: Department of Psychology, University of Groningen, pp. 183-201.

Bushe, S., 2010. Clean Energy Policy Analyses: Analysis of the Status and Impact of Clean Energy Policies at the Local Level. *Technical Report* NREL/TP-6A20-49720.

Dwyer, W. O., Leeming, F. C., Cobern, M. K., Porter, B. E. and Jackson, J. M., 1993. Critical review of behavioral interventions to preserve the environment. Research since 1980. *Environment and Behavior,* 25(5), pp. 275-321.

Edgerton, E., McKechnie, J. and Dunleavy, K., 2009. Behavioral determinants of household participation in a home composting scheme. *Environment and Behavior,* 41(2), pp. 151-169.

Hunecke, M., Haustein, S., Boöhler, S. and Grischkat, S., 2010. Attitude-based target groups to reduce the ecological impact of daily mobility behavior. *Environment and Behavior*, 42(1), pp. 3-43.

Johnson, S. M., 2009. Is religion the environment‘s last best hope? Targeting change in individual behavior through personal norm activation. *J. Environ. Law Litigation*, 24(1), pp. 119–164.

Kaiser, F. and Schultz, P., 2009. The attitude-behavior relationship: A test of three models of the moderating role of behavioral difficulty. *Journal of Applied Social Psychology*, 39(1), pp. 186-207.

Kennedy, A., 2010. Using Community-Based Social Marketing Techniques to Enhance Environmental Regulation. *Sustainability*, 2(4), pp. 1138-116.

Kollmuss, A. and Agyeman, J., 2002. Mind the gap: Why do people act environmentally and what are the barriers to pro-environmental behavior? *Environmental Education Research.*, 8(3), pp. 239–260

Lindseth, G., 2004. The Cities for Climate Protection Campaign (CCPC) and the Framing of Local Climate Policy. *Local Environment*, 9(4), pp. 325–336.

Lutsey, N. and Sperling, D., 2008. America's Bottom-up Climate Change Mitigation Policy. *Energy Policy*, 36(2), pp. 673–685.

McKenzie-Mohr, D. and Smith, W., 1999. *Fostering Sustainable Behavior: An Introduction to Community-Based Social Marketing*. Gabriola Island, BC, USA: New Society Publishers.

Mullaly, C., 1998. Home energy use behaviour: a necessary component of successful local government home energy conservation (LGHEC) programs. *Energy Policy*, 26 (14), pp. 1041-1052.

Niemeyer, S., 2010. Consumer voices: Adoption of residential energy-efficient practices. *International Journal of Consumer Studies*, 34(2), pp. 140-145.

Pears, A. and Greene, A., 1999. *Managing Energy in Local Government*. Canberra: Australian Greenhouse Office.

Petkeviciute, N. and Streimikiene, D., 2014. Sustainable Agreements During Inter-Cultural Negotiation. *Transformations in Business and Economics*, 13(3(33)), pp. 21-36.

Steg, L., 2008. Promoting household energy conservation. *Energy policy*, 36(12), pp. 4449-4453.

Steg, L., Dreijerink, W. and Abrahamse, V., 2006. Why are Energy Policies Acceptable and Effective? . *Environment and behavior*, 38(1), pp. 92-111.

Streimikiene, D. and Balezentiene, L., 2014. Comparative assessment of heat generation technologies in district heat sector of Lithuania. *Transformations in Business and Economics*, 13(2(32)), pp. 161-174.

Streimikiene, D., Baležentis,T. and Krikščiukaitienė, I., 2012. Promoting interactions between local climate change mitigation, sustainable energy development, and rural development policies in Lithuania. *Energy Policy*, 50, pp. 699-710.

Sweeney, D., 2009. *Show me the Change. A review of evaluation methods for residential sustainability behavior change projects*. Australia: Swinburne University of Technology.

Vandenbergh, M. P. and Steinemann, A. C., 2007. The Carbon Neutral Individual. *N.Y. Univ. Law Rev.*, 82(6), pp. 1673.

Vasauskaite, J. and Streimikiene, D., 2014. Review of Energy Efficiency Policies in Lithuania. *Transformations in Business and Economics*, 13(3C (33C)), pp. 628-643.

Walton, D. and Sunseri, S., 2010. Factors Influencing the Decision to Drive or Walk Short Distances to Public Transport Facilities. *International Journal of Sustainable Transportation*, 4(4), pp. 212-226.

Wray-Lake, L., Flanagan, C. and Osgood, D., 2010. Examining trends in adolescent environmental attitudes, beliefs, and behaviors across three decades. *Environment and Behavio*r, 42(1), pp. 61-85.