



Energy savings from intelligent metering and behavioral change of the citizens of Amaroussion

Results of 2nd Questionnaire

Sample of citizens who participated in the household electricity measurement campaign

December 2009

- The **main objective** of this survey was the evaluation of the impact of our intervention (measurement campaign, website, 1st questionnaires) on Amarooussion citizens' residential energy consumption patterns.
 - To what extent has there been a change (improvement) in the determinants of change? Among which target groups?
 - To what extent have these changes been established at behavioral level?

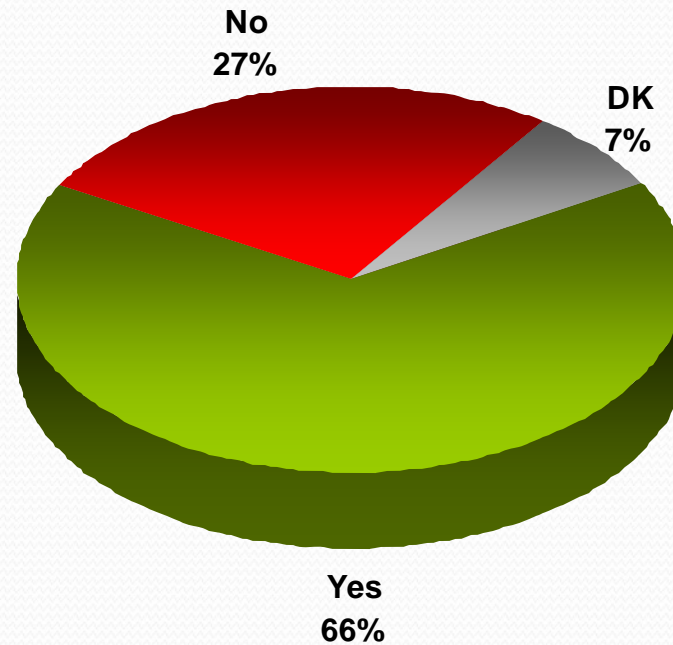
- The questionnaires have been sent through e-mails or delivered by hand to the 30 citizens which took part at the measurement campaign (repetition group). 15 questionnaires were answered and sent back. The impact of the intervention was evaluated
 - a) by including a group of questions specific to the intervention
 - b) by comparing the answers to the questionnaire before and after the metering device installation.
- As the questionnaire was self-completed, not all questions have been answered by the total number of participants

Main Findings

- **RES:** Renewable Energy Sources
- **EE:** Energy Efficiency
- **TV:** television
- **ECO:** a prefix relating to ecological terms
- **LCD:** Liquid Crystal Display
- **PV:** photovoltaic

Group of questions specific to the intervention

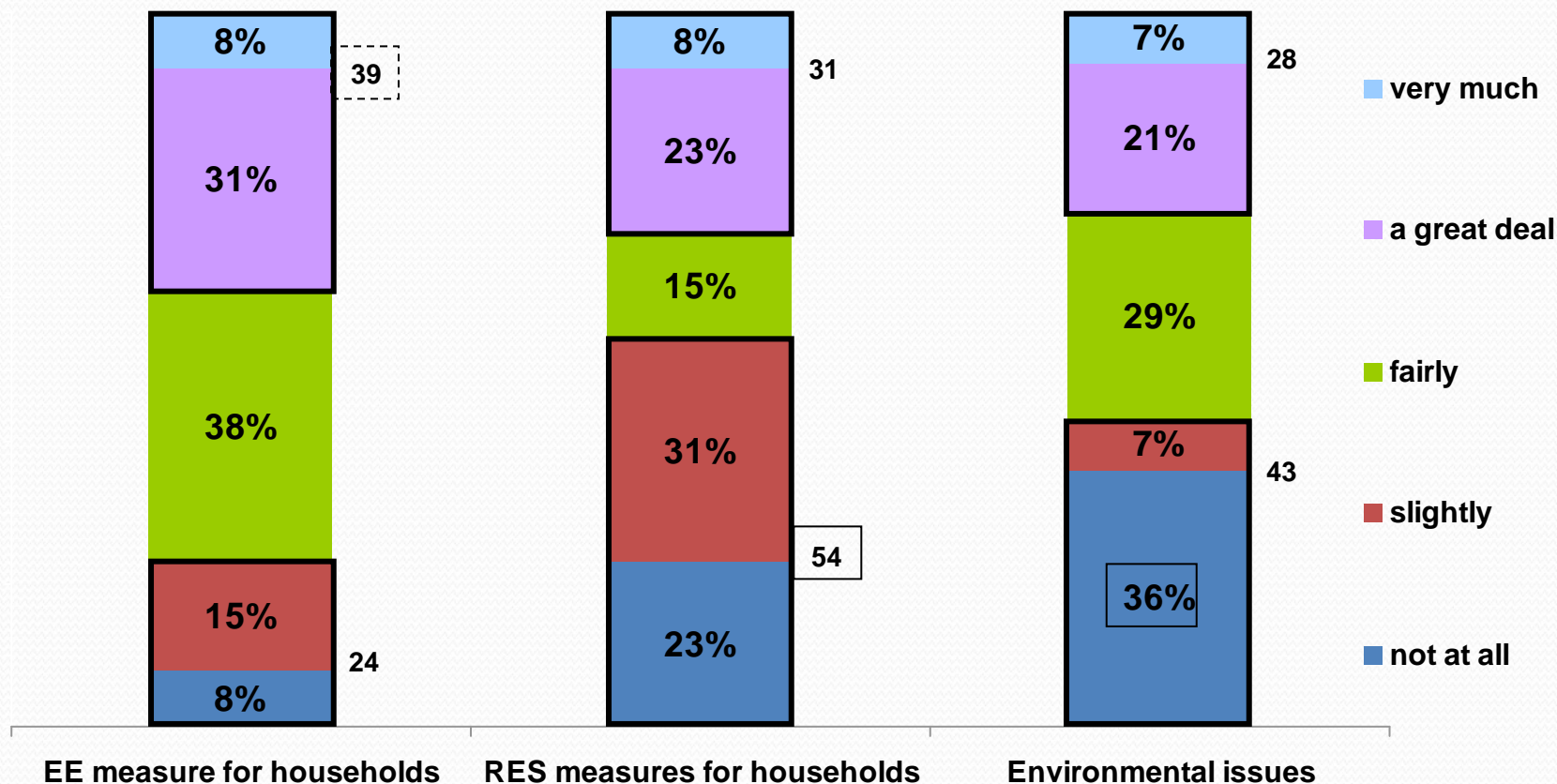
66% claim that their participation has enhanced their knowledge on energy saving



Degree of attitude influence after the household measurement campaign and visiting the website application

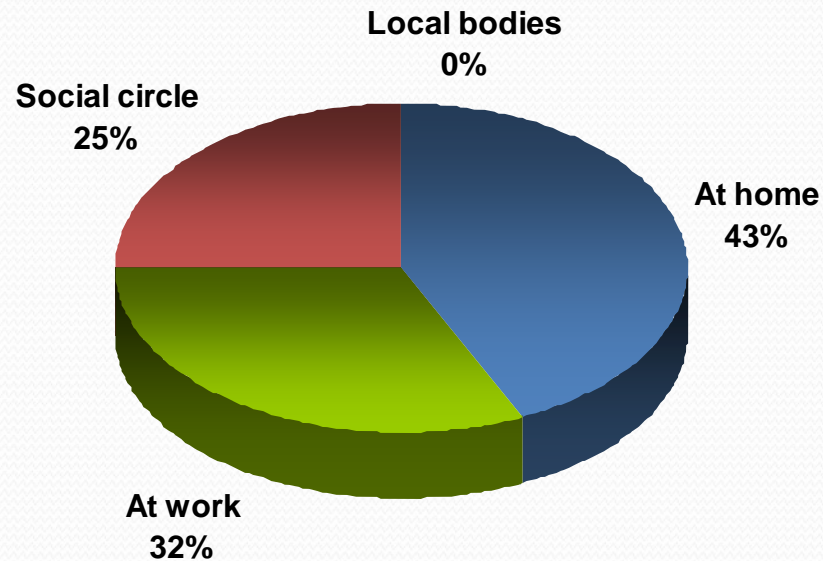


As expected, citizens were influenced mainly concerning Energy Efficiency (EE) measures for households. The degree of impact was fair for most of them.

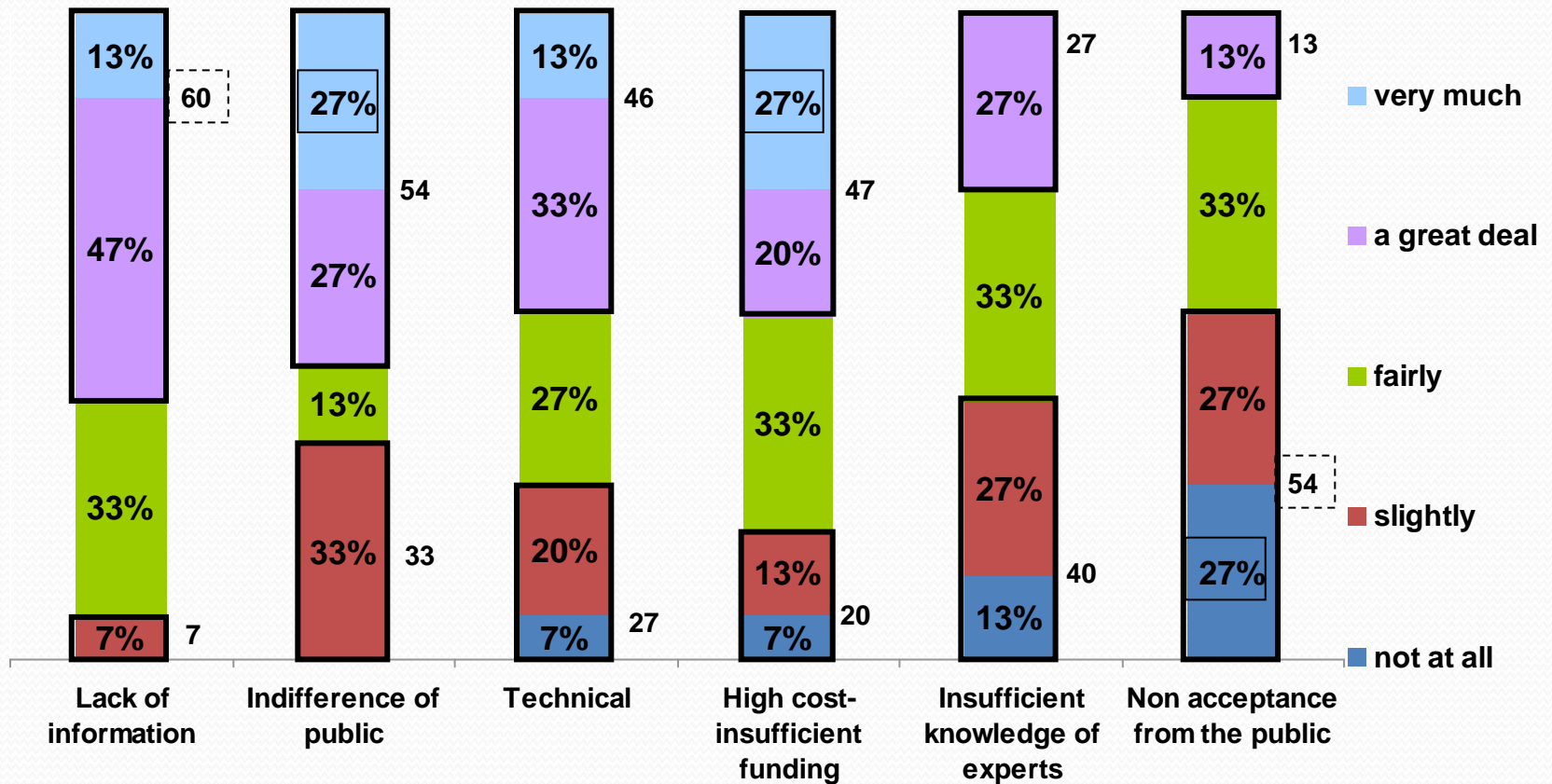


After participating in the household measurement campaign and visiting the website application devoted to the intervention, did your attitude get influenced regarding the EE measures for households, the RES measures for households, the environmental issues, and/or other issues?

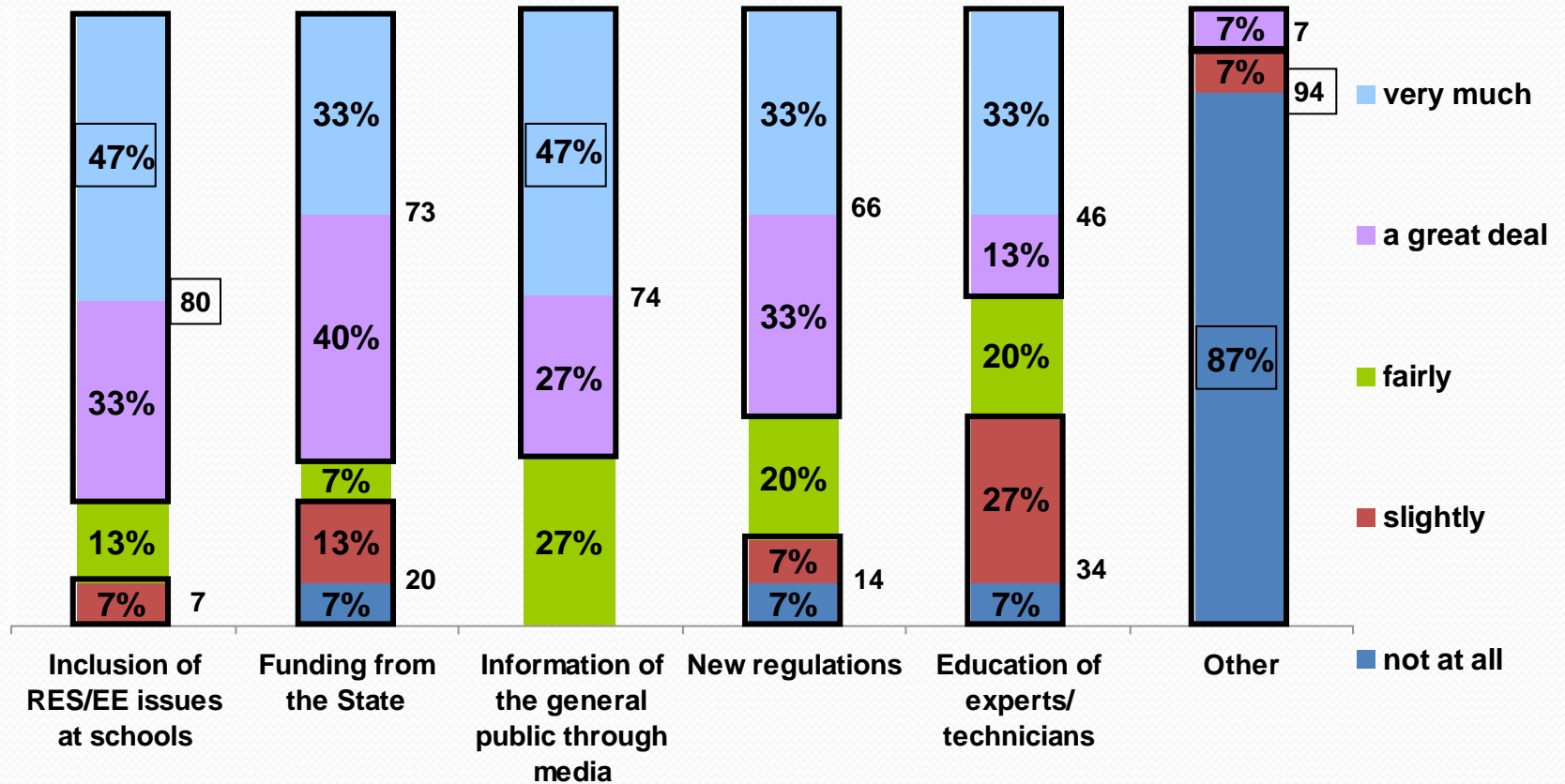
Given the fact that households kept the metering device for 15 days, most citizens discussed the RES/ EE issues at home, followed by discussions at work, while there was no incidence of any participant contacting local bodies.



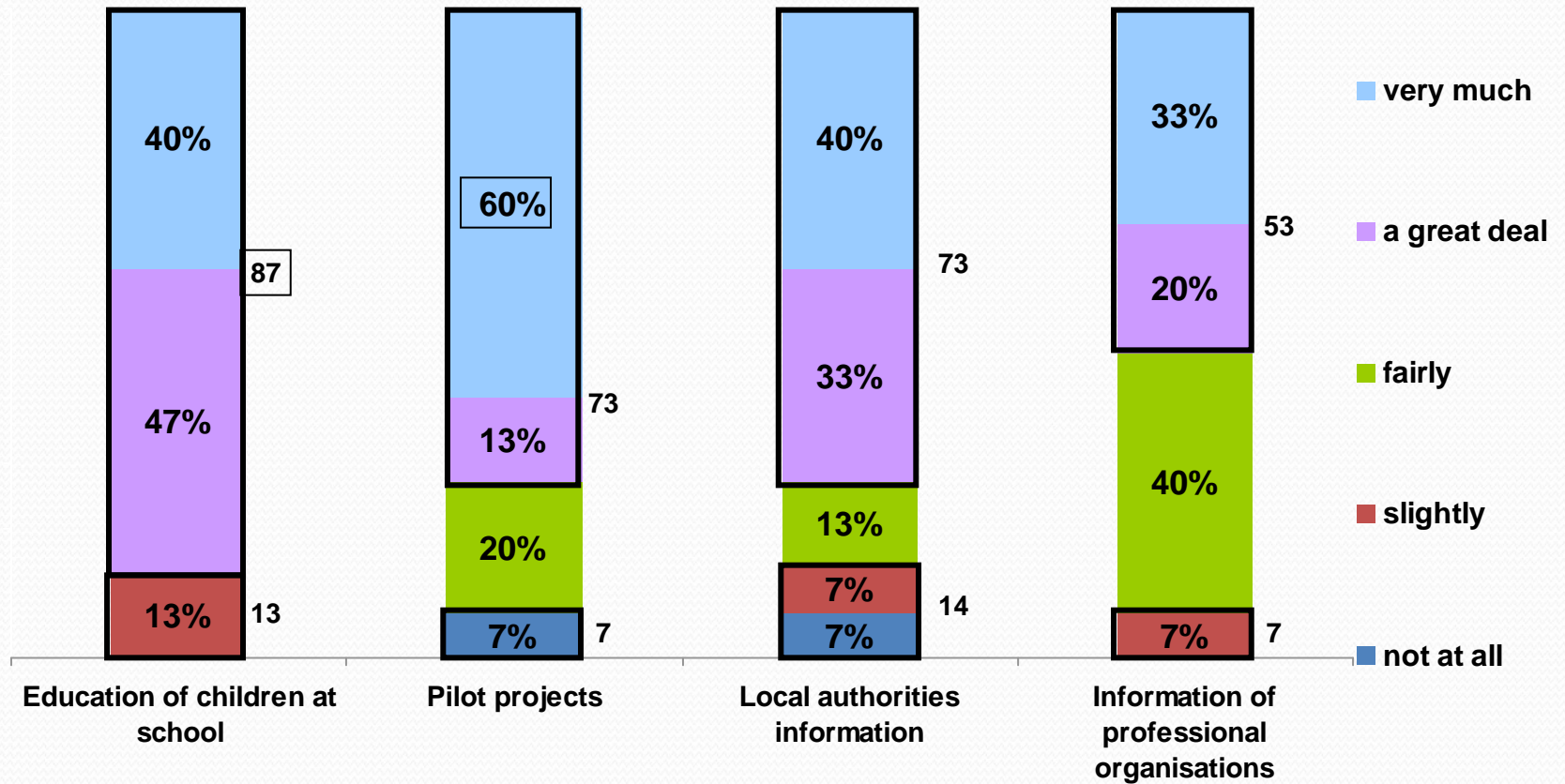
According to the citizens of Amaroussion, lack of information and indifference of public are the main barriers when it comes to apply specific RES and EE measures.



Education on RES and EE at schools, information of general public through media and funding from the State rank first as actions that should be taken to raise the barriers.



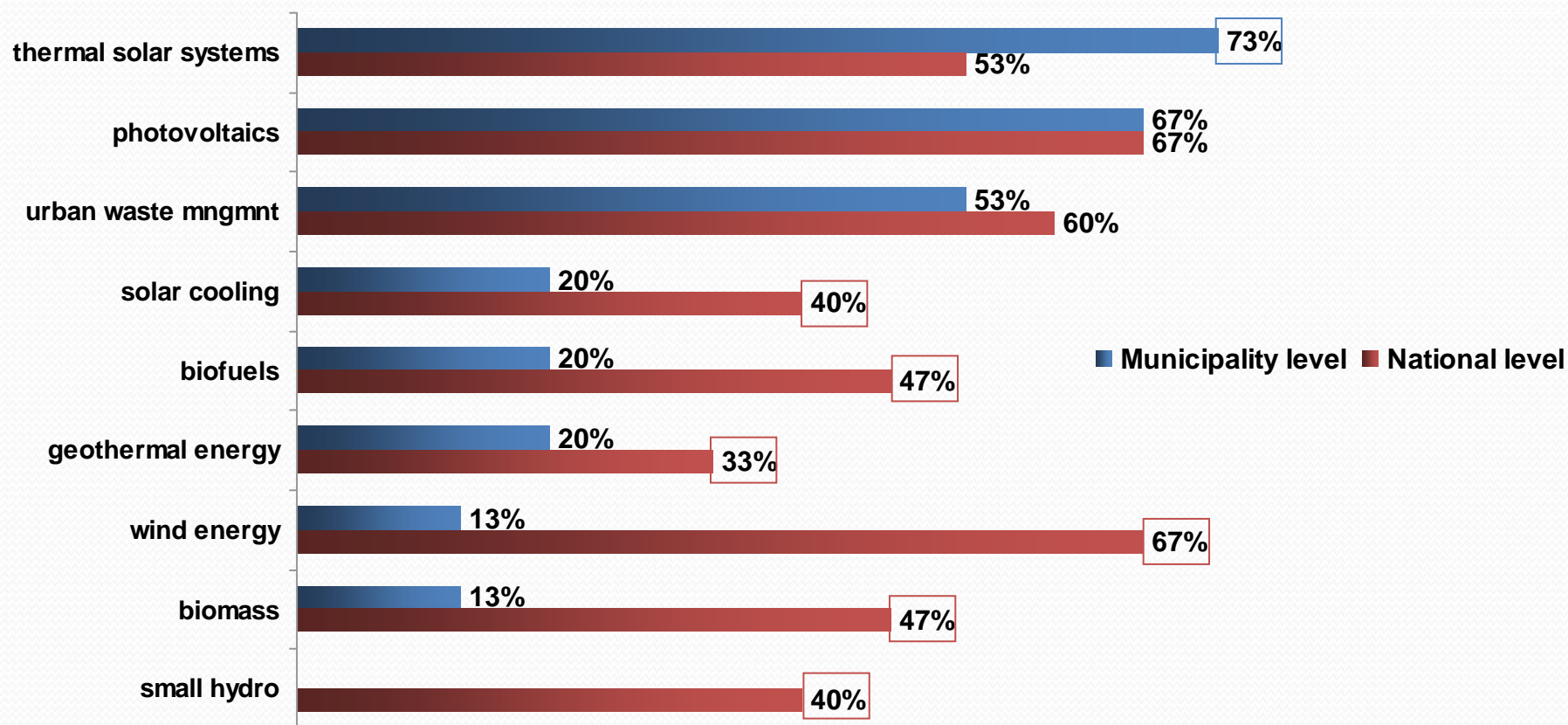
Demonstration/ pilot projects as well as education at schools are very important according to the citizens and this should be taken seriously into account by the local authorities of the Municipality.



Most important RES technologies for Municipality and National level



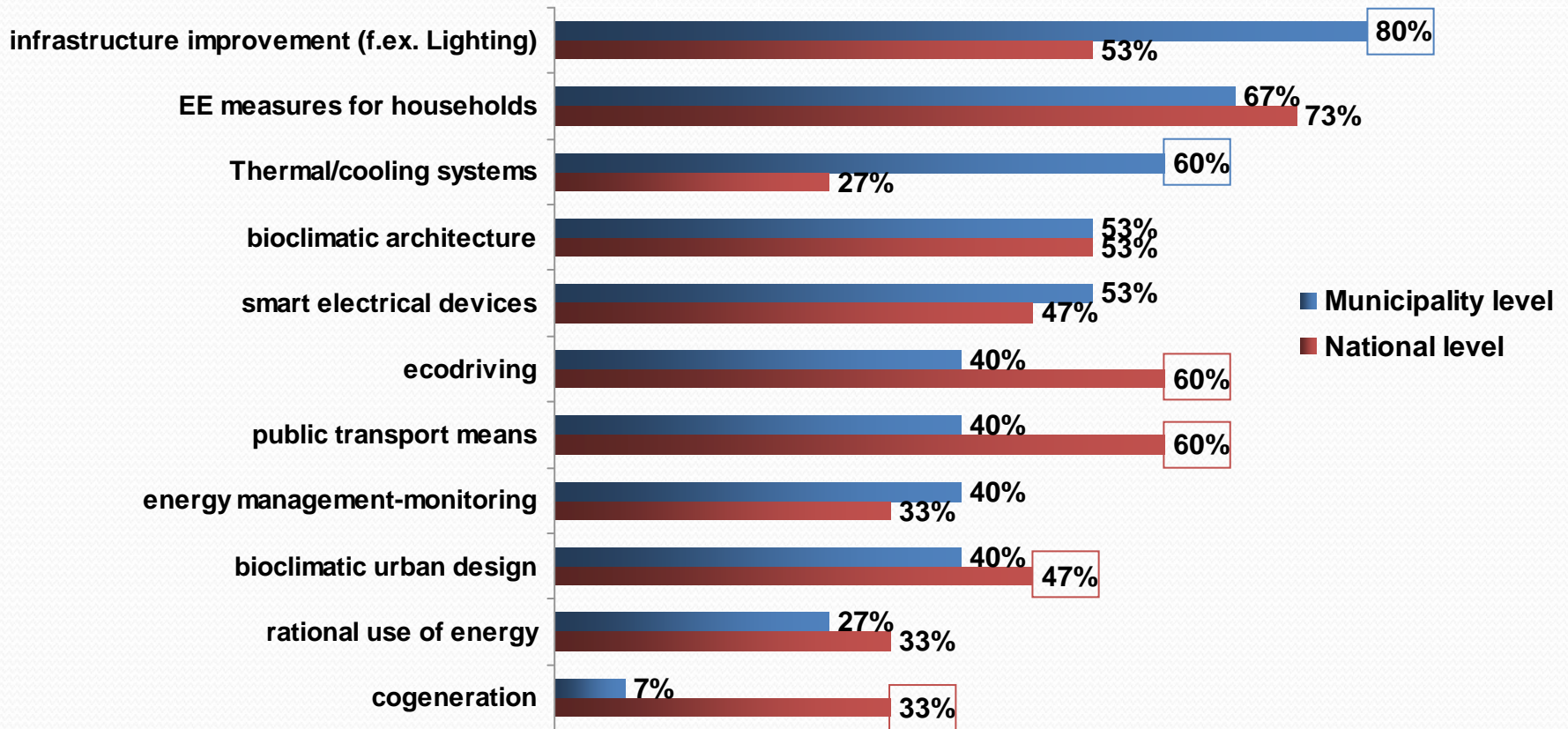
The majority of citizens are more positive towards the application of thermal solar systems and PVs at Municipality level and equally positive towards wind and PV parks at national level.



Most important EE technologies for Municipality and National level



The majority of citizens are more positive towards the improvement of infrastructure at Municipality level (f.ex. lighting of streets, public transport) and EE measures for households, both at municipality and country level, which is very encouraging.



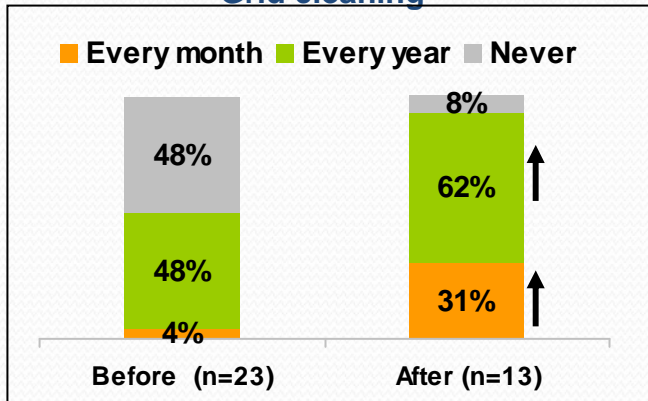
Answers to the questions of the questionnaire after the metering device installation – future predictions

Respondents are willing to improve their energy consumption habits.

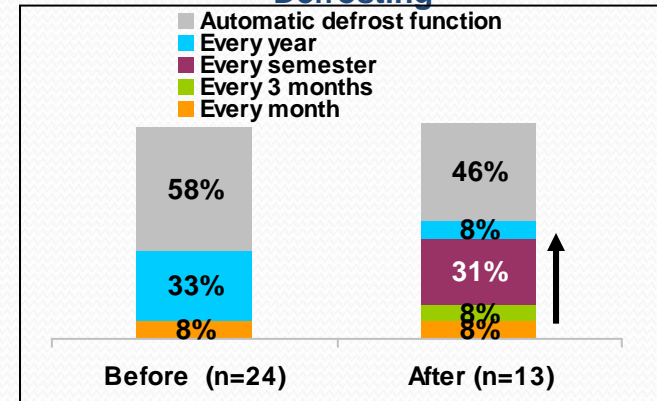
More analytically...

6 in 10 respondents intend to clean the grid on the back side of their refrigerators once a year and 3 in 10 will defrost the refrigerators that have not an automatic defrost operation once every 6 months. All the respondents claim that they will set the thermostats in the mid position. On the other hand, 33% of the respondents do not intend to change the positions of the refrigerators that are face to a cooking appliance

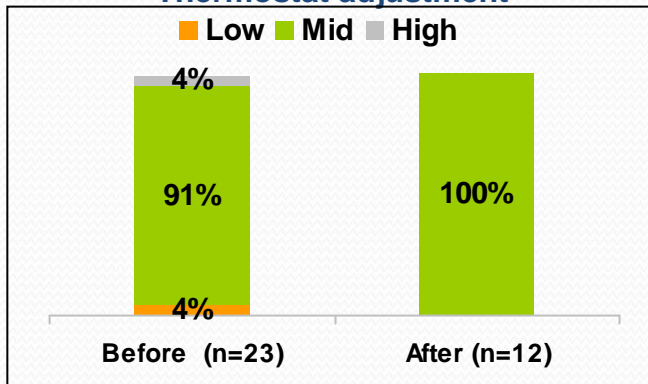
Grid cleaning



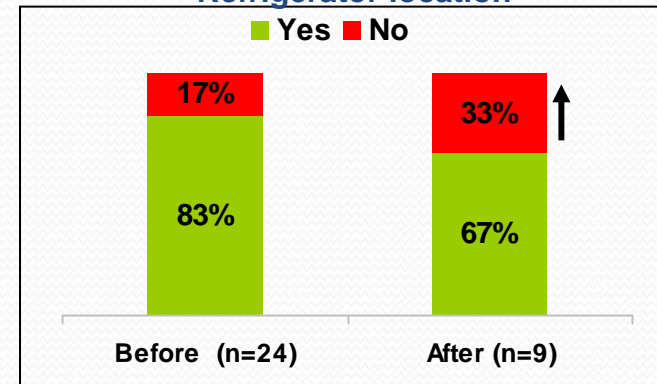
Defrosting



Thermostat adjustment



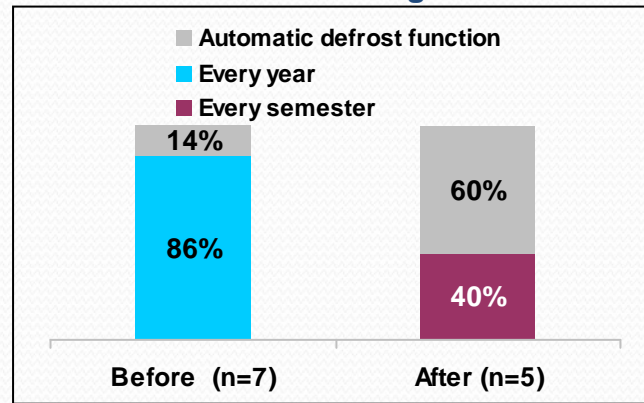
Refrigerator location



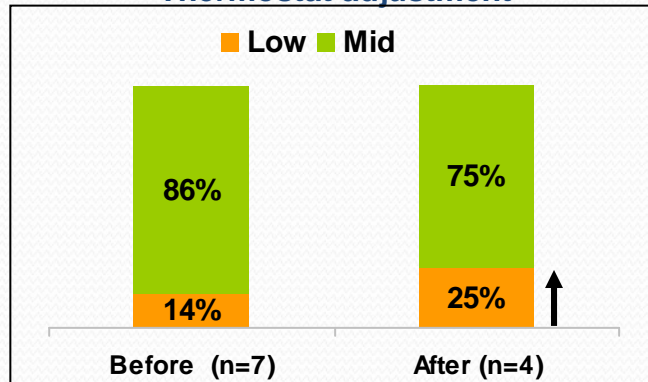
How often do you intend to clean the grid at the back of the refrigerator? / defrost?
 How do you intend to adjust the thermostat?
 If your refrigerator is located across a cooking appliance do you intend to move it?

6 in 10 freezers have an automatic defrost operation and 4 in 10 are intended to be defrosted twice per year. 75% of the thermostats will be set to the mid position and all freezers will be placed away from a cooking appliance.

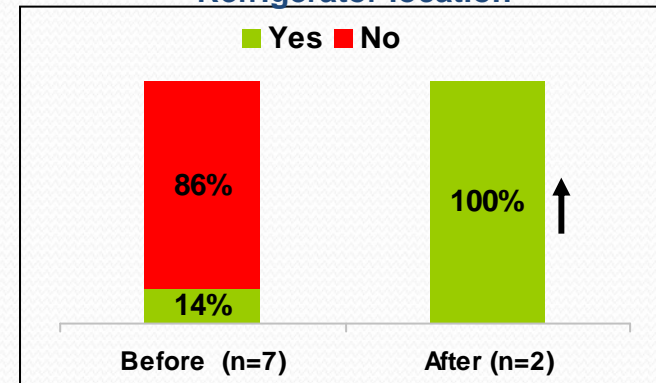
Defrosting



Thermostat adjustment



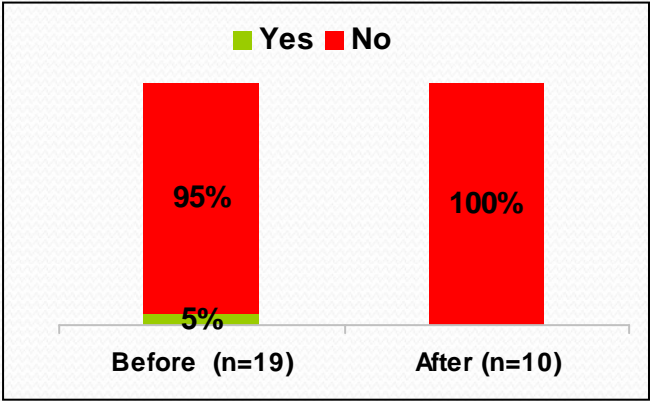
Refrigerator location



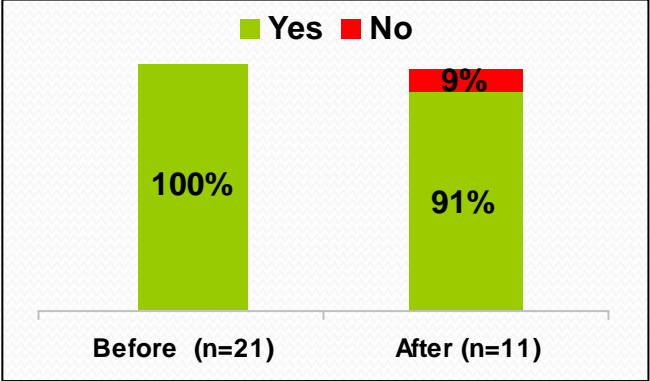
How often do you intend to defrost the freezer?
 How do you intend to adjust the thermostat?
 If your freezer is located across a cooking appliance do you intend to move it?

Citizens do not intend to place cooked food in the fridge / freezer before it cools down and the vast majority plans to cover the dishes before they are being put in the fridge / freezer. It is also being concluded that most of them intend to check the energy label before buying a new refrigerator or a freezer

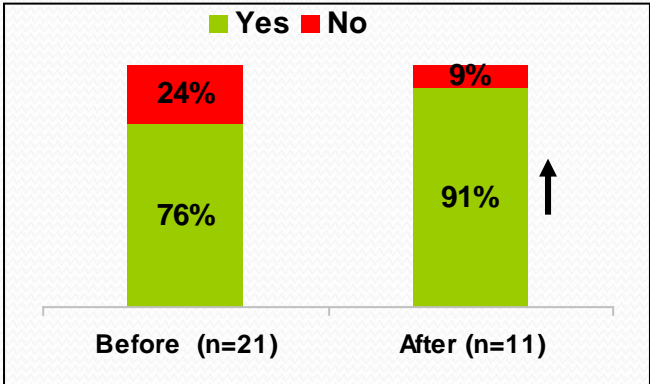
Cooked food before cooling



Cover dishes



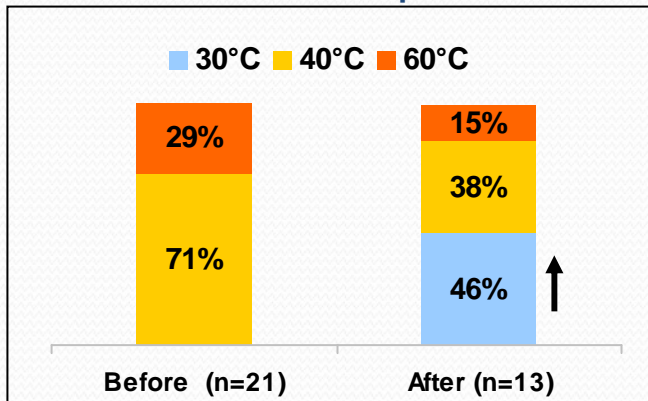
Check energy label



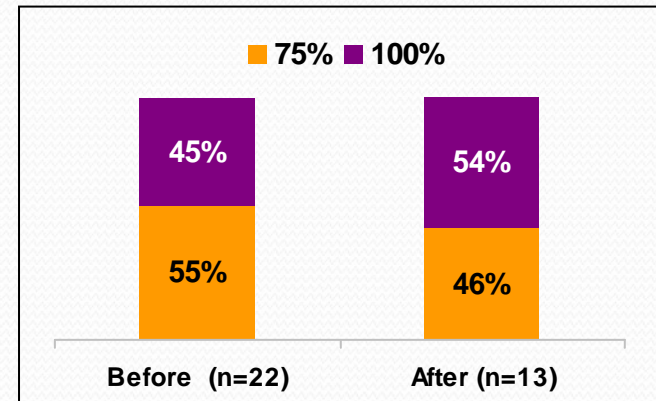
Do you intend to put cooked food in the refrigerator / freezer before it has cooled? / to cover the dishes before putting them in the refrigerator / to check the energy label when purchasing a refrigerator / freezer?

Interesting is the fact that almost 1 in 2 intend to reduce the washing temperature to 30°C. Also, half of the participants claim that they will fully load the washing machine before operating it. Furthermore, 1 in 4 will use the ECO button, albeit more than half do not have such a function. 7 in 10 do not intend to supply the washing machine with hot water from the heater.

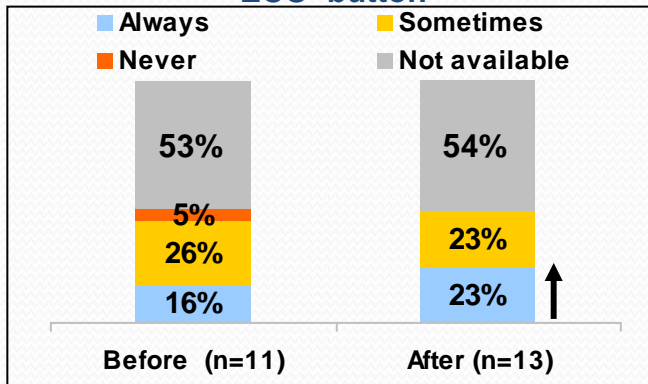
Reduce water temperature



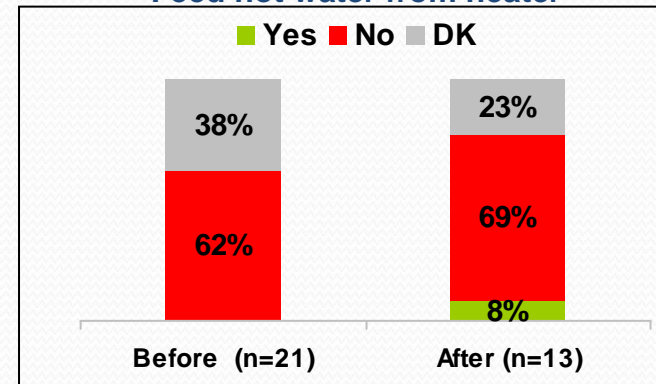
Load



ECO button



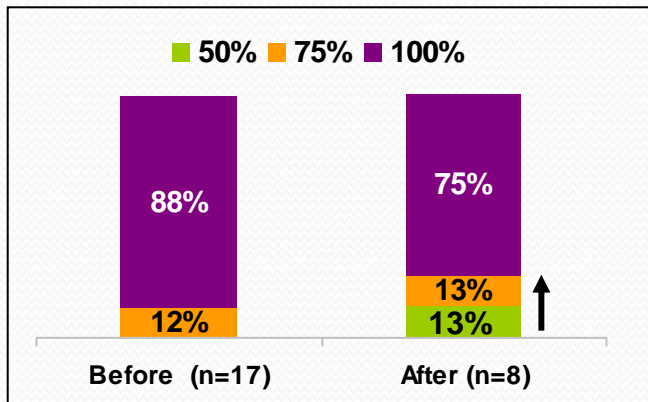
Feed hot water from heater



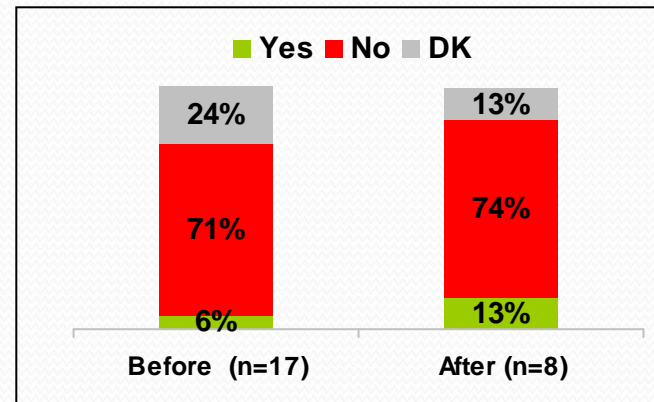
Do you intend to reduce the washing temperature of your washing machine? / to load it to the maximum? / to use the ECO button? / to feed it with hot water coming from your heater?

Most respondents support that they will fill their dishwashers in 75% or more. 3 in 4 will not use hot water from the heater. Half dishwashers do not have an ECO button, while 4 in 10 intend to use it at all times. The majority will check the energy label next time they will buy a washing appliance.

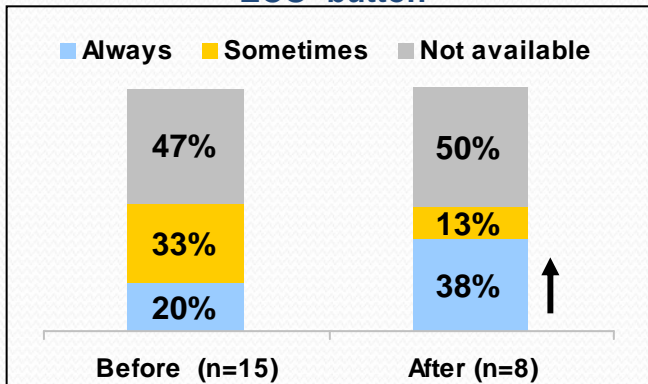
Load



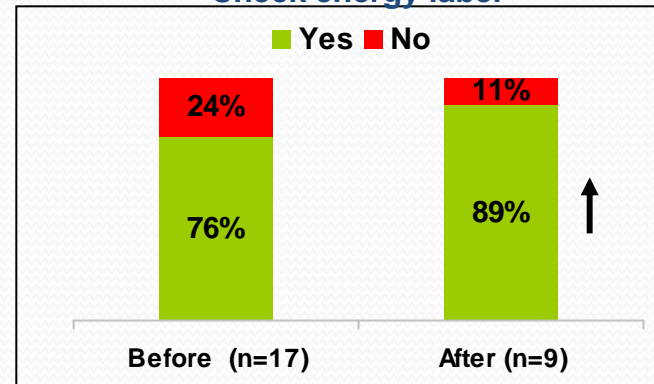
Feed hot water from heater



ECO button

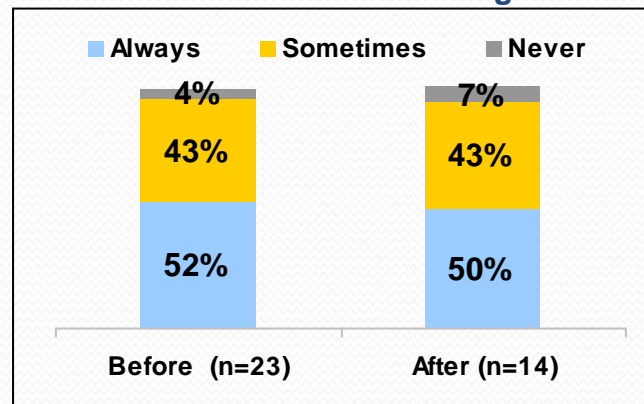


Check energy label

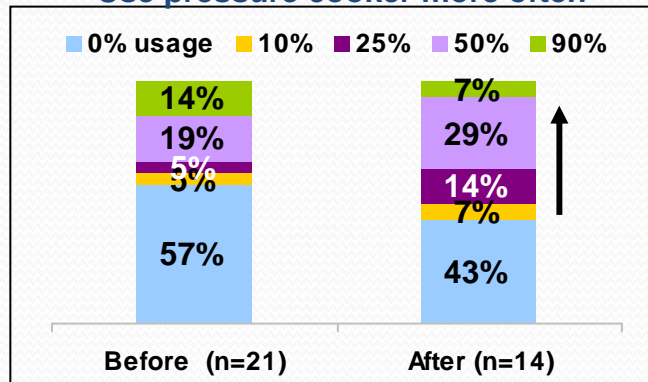


Half respondents will always cover the lid of the pot while cooking. The defrosting of food will be done usually at room temperature. 43% do not intend to use pressure cookers more in the future

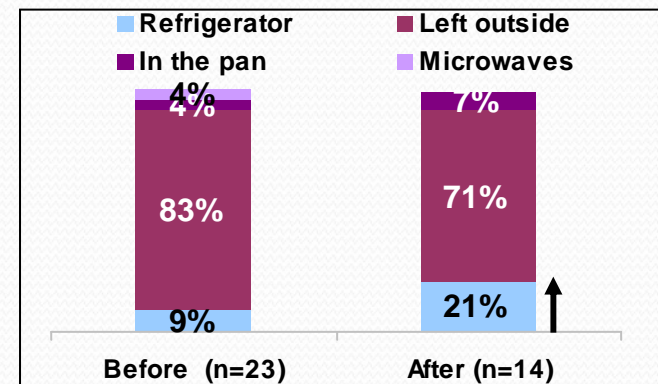
Put lid while cooking



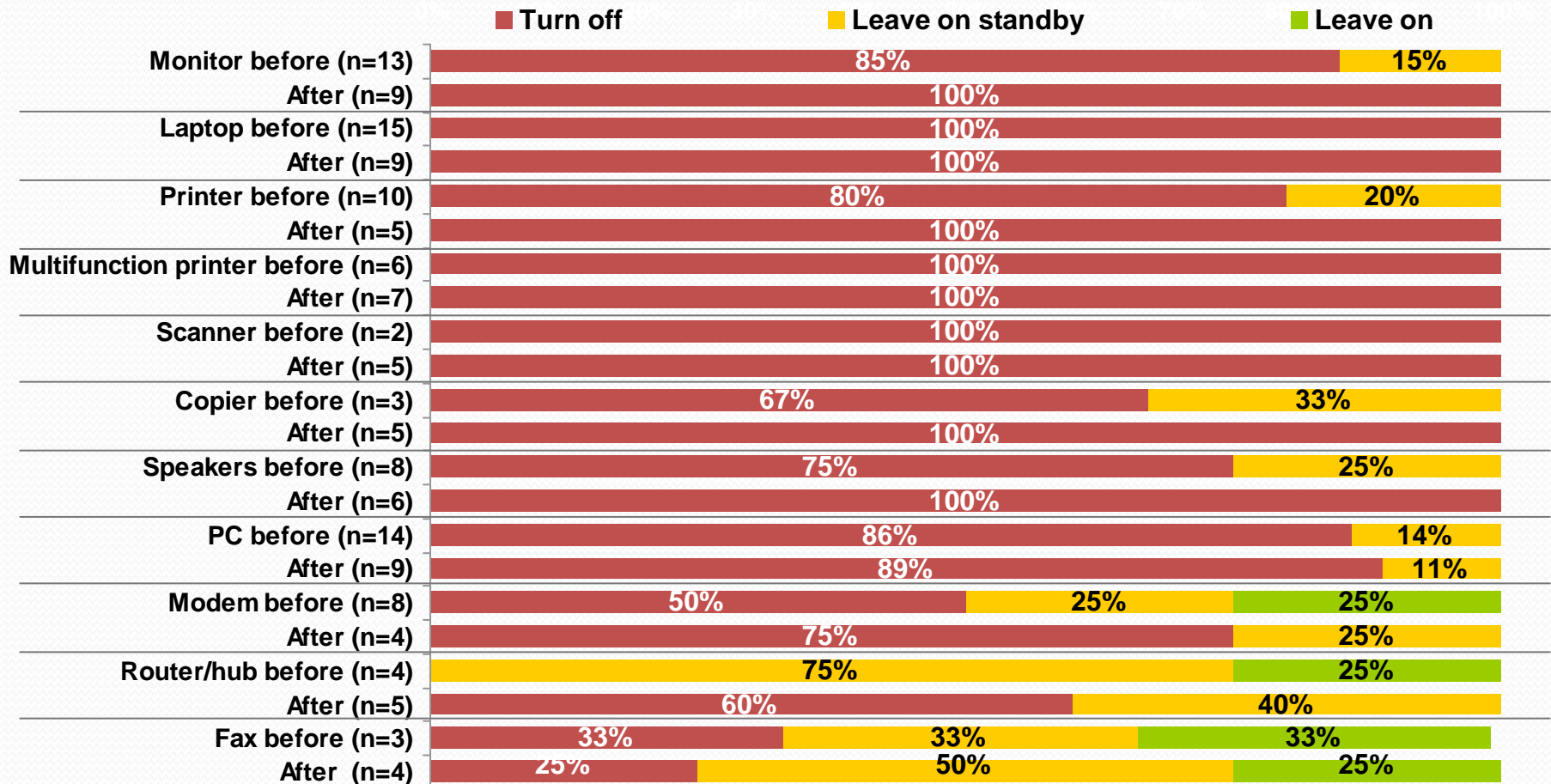
Use pressure cooker more often



Defrost food

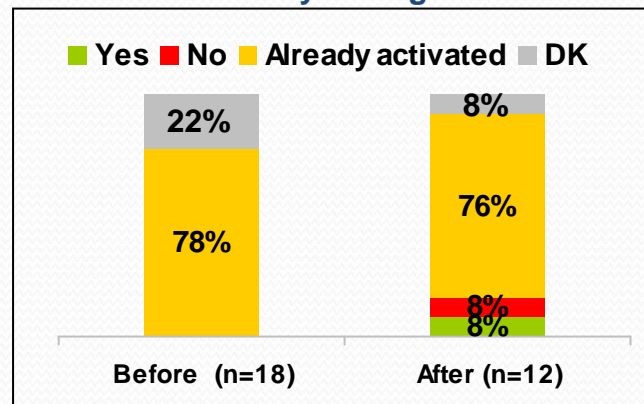


Most office appliances will be turned off from now on, even the respondents that did not use to

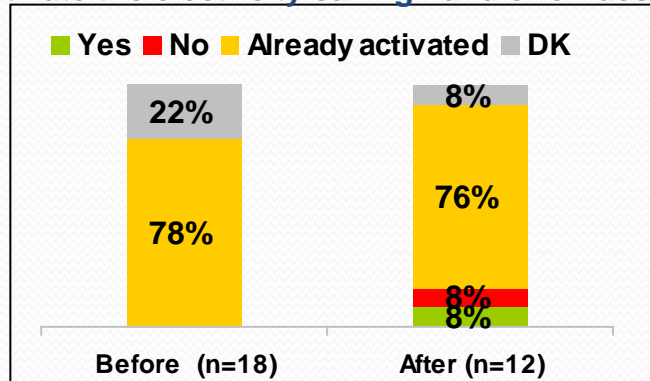


Most respondents have already turned on the power saving options for their screens and their computers or they intend to do so. They also support that they will check the energy label before buying a new office appliance

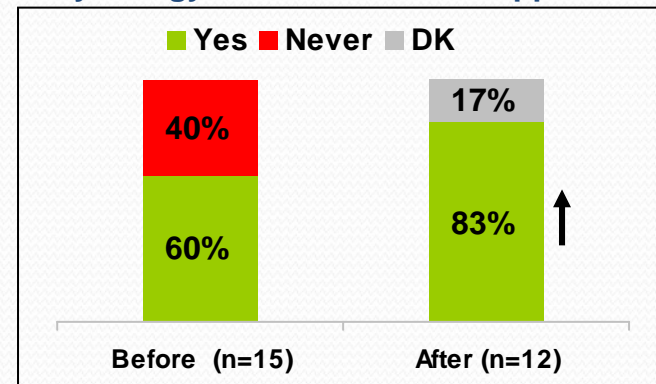
Activate the electricity saving handler on monitor



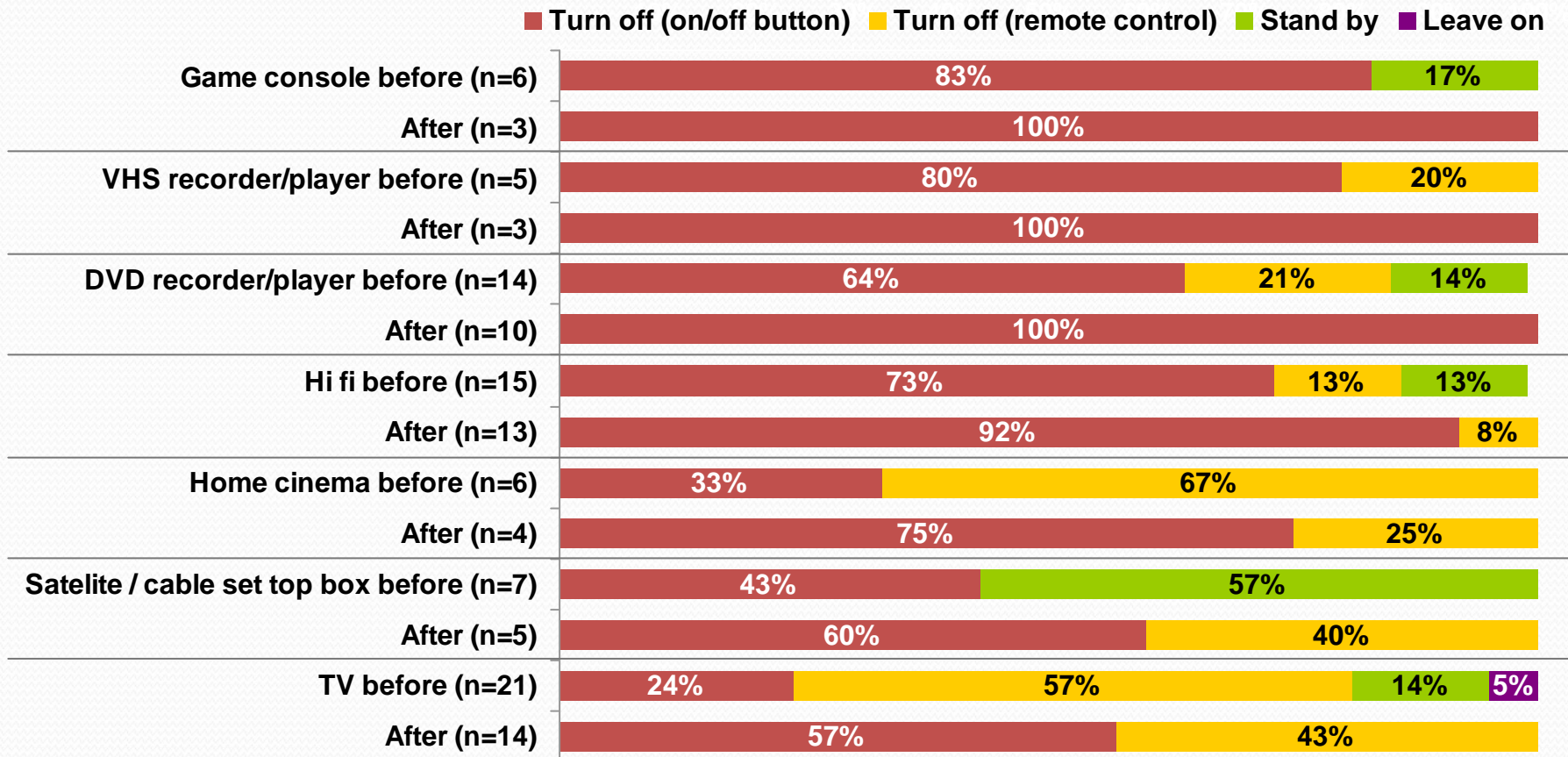
Activate the electricity saving handler on desktop



Buy energy star labeled office appliance

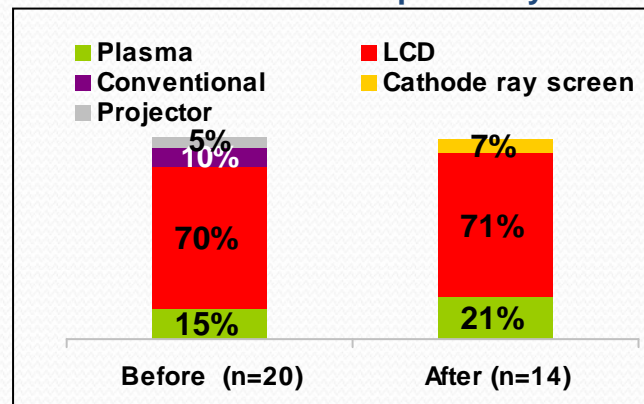


These appliances except from the TV and the satellite / cable set top box will be mainly turned off from their on/off button.

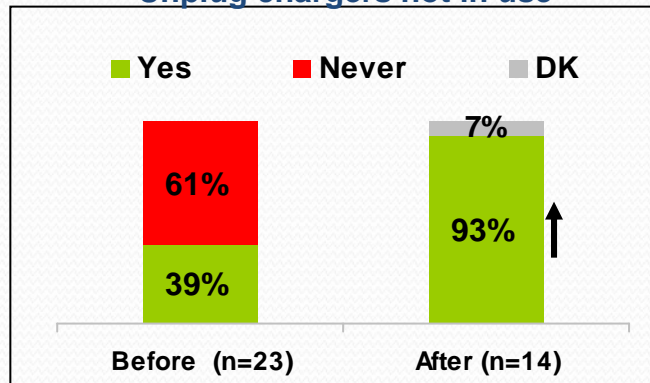


The LCD TVs are the first choice of most citizens when replacing their TVs. Almost all agree that chargers will get unplugged when not in use. Also almost everyone intends to have a multisocket with switch for simultaneously switching all devices.

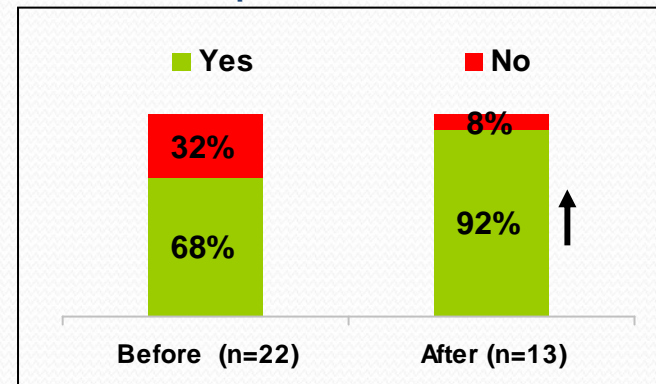
Current TV set replaced by...



Unplug chargers not in use



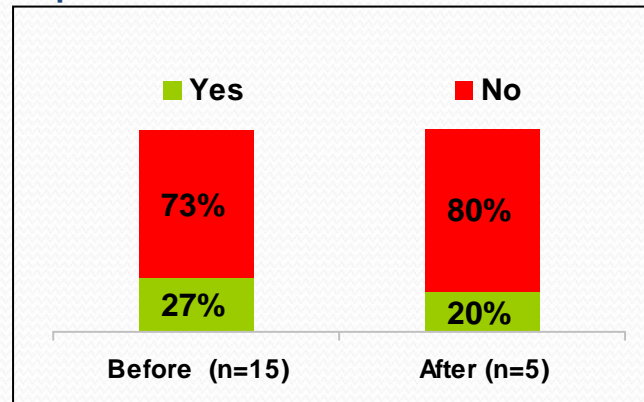
Use multiple sockets with switch



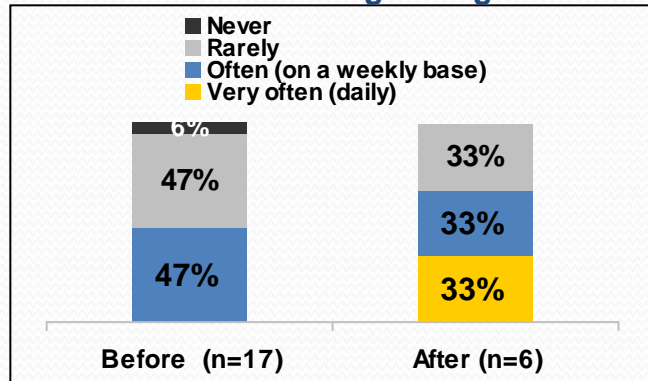
1 in 5 will still unfortunately have doors/windows open at the same time with air conditioning on and 17% intends to use the air-conditioning system for heating purposes as well.

Set temperature at winter: 22.2° C, set temperature at summer: 22.1° C

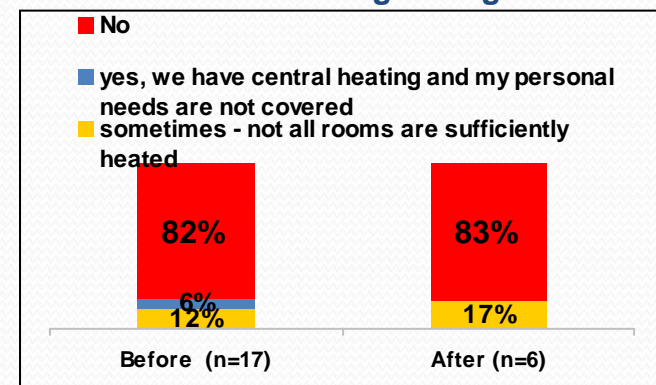
Leave open doors / windows while air conditioning is on



Use air conditioning during summer

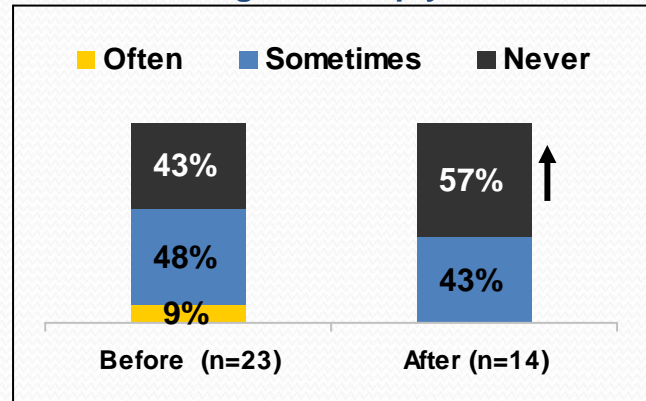


Use air conditioning during winter

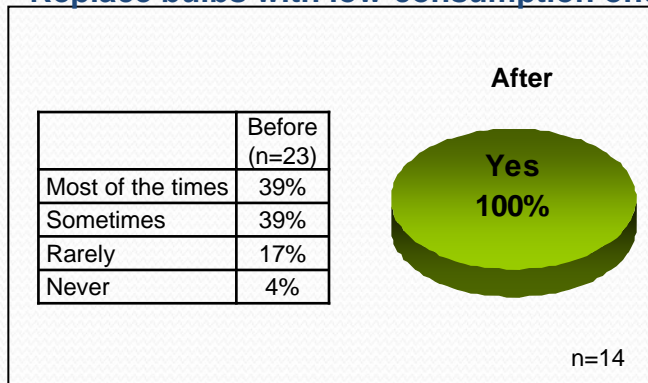


Citizens are unfortunately not fully convinced about the need to turn off the lights in empty rooms, however all of them intend to replace their light bulbs with low-consumption ones. Fewer are those who intend to leave open lights in rooms where nobody is present and almost all intend to use artificial lights for lesser time during daylight.

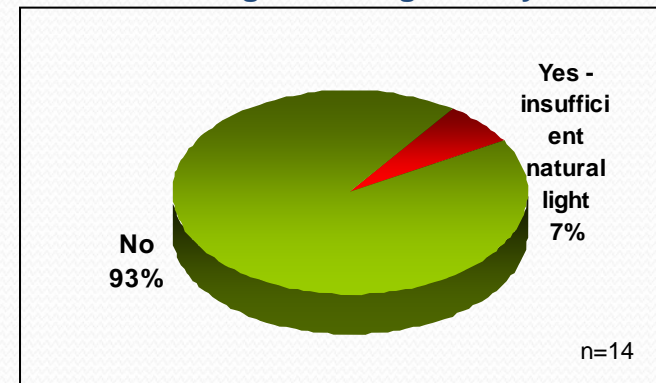
Lights in empty room



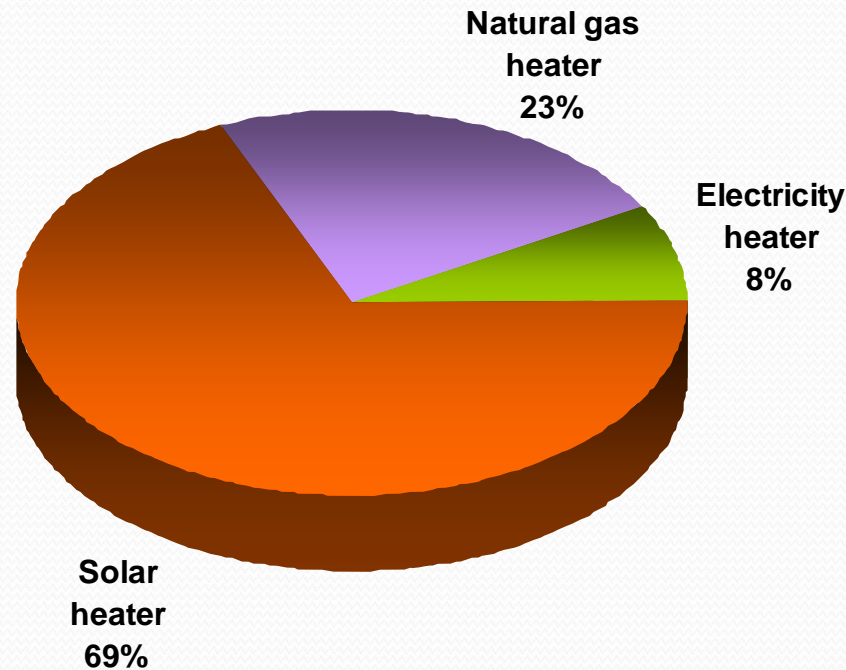
Replace bulbs with low-consumption ones



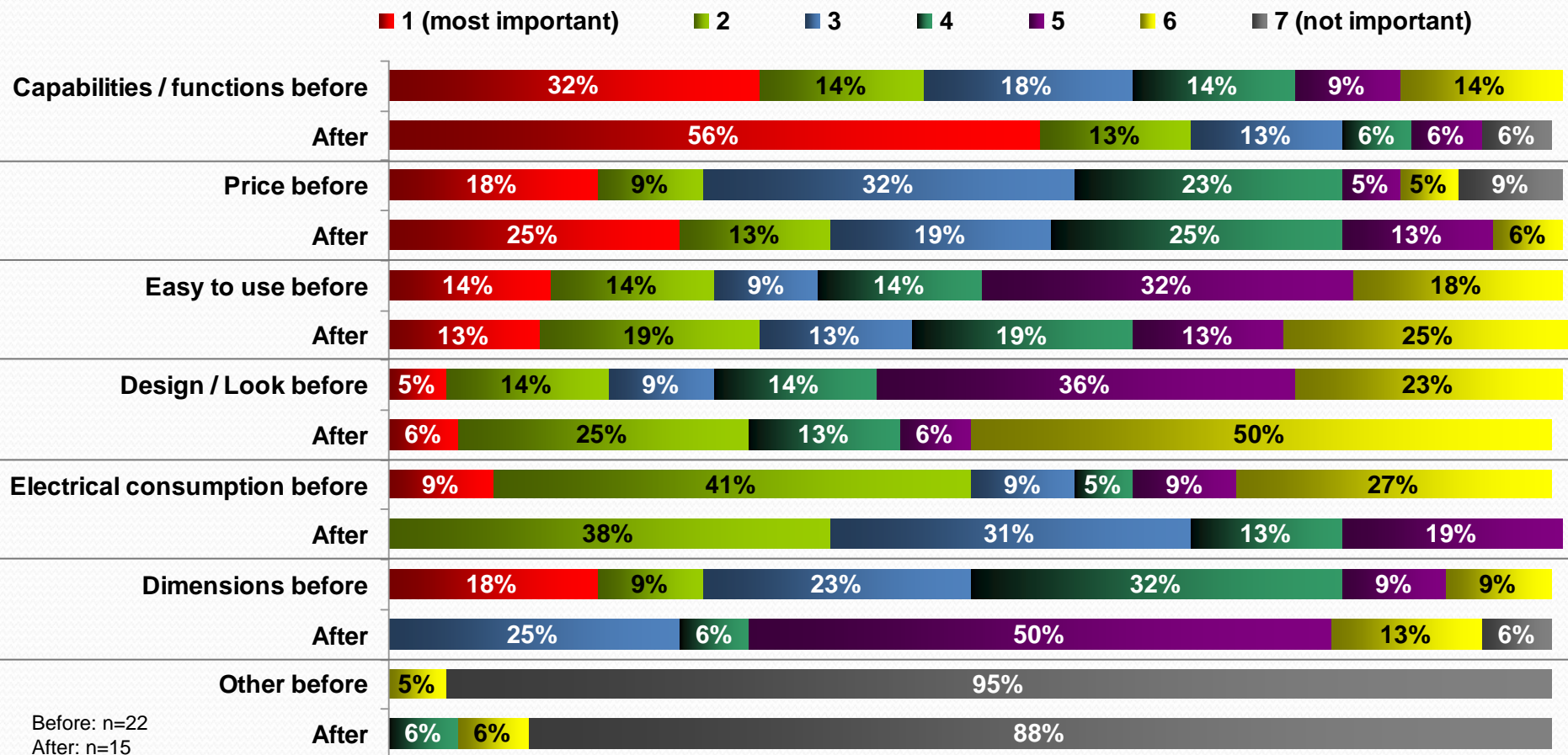
Use lights during the day



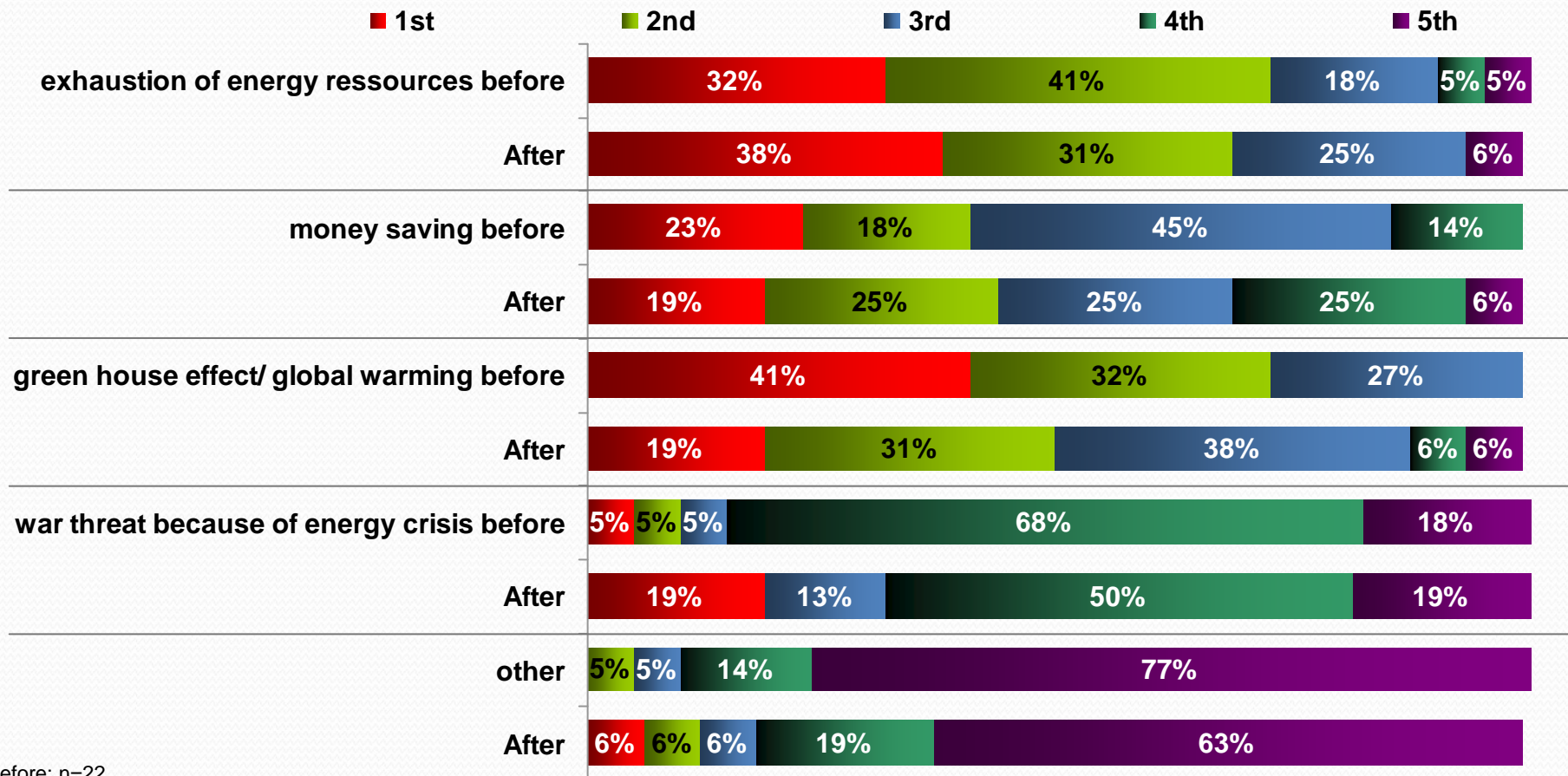
Most citizens would chose a solar thermal heater as their new heater, if they had to replace their current one, but still 8% would prefer to buy a new electric heater. This is encouraging if we consider that 30 years ago, almost all Greek households were using electric heaters. The motivations to buy a solar system are savings (expected payback period 5-10 years), better comfort, and easy installation.



Again the most important criterion when purchasing a new electric appliance are the capabilities/ functions. Energy consumption is not the most important criterion for anyone but is an important criterion for 4 to 10 citizens.



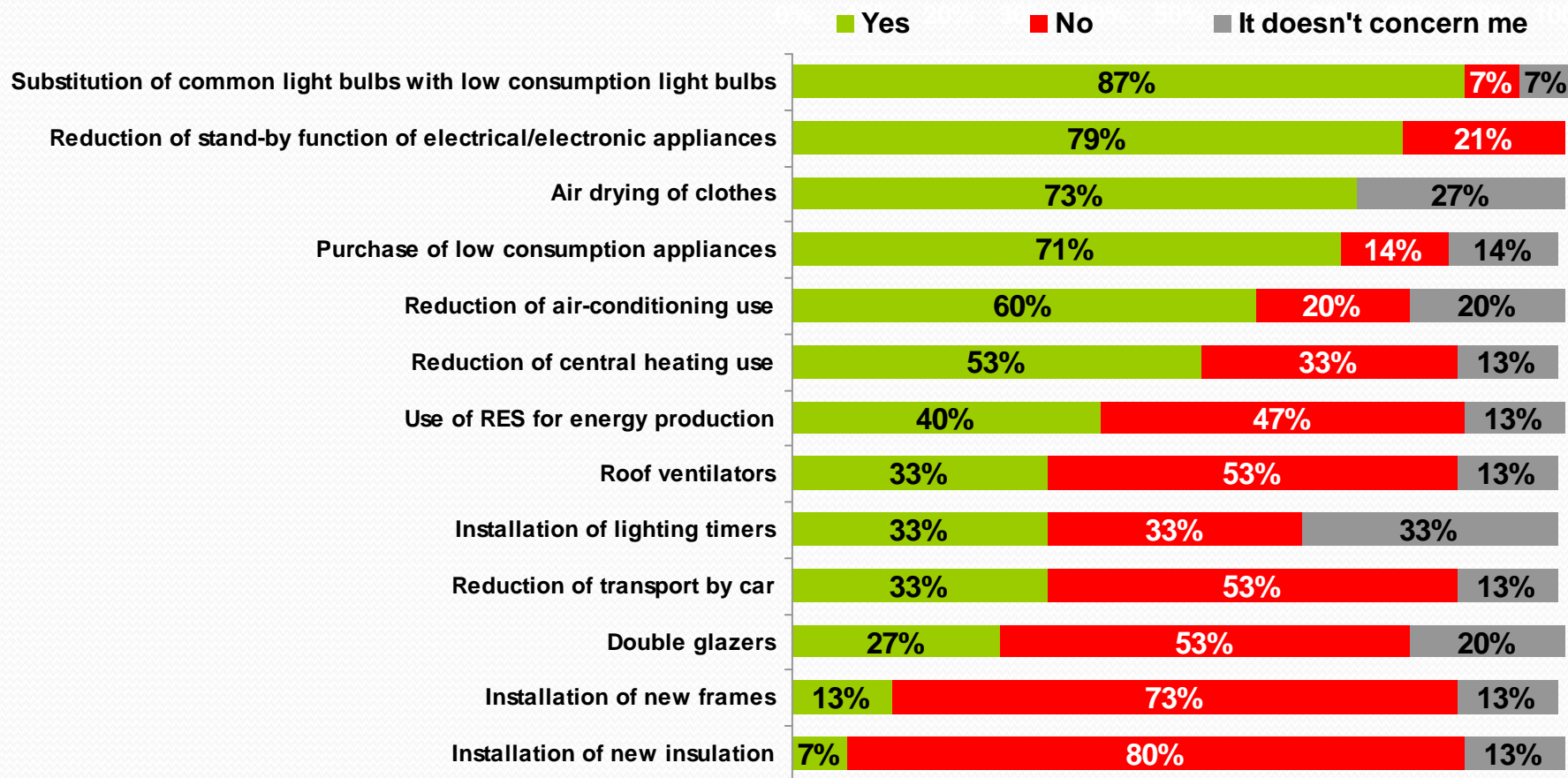
The exhaustion of energy resources takes the 1st place from the green house effect/ global warming, probably because citizens realized the extent of the problem after taking part to the measuring campaign.



Before: n=22
After: n=15

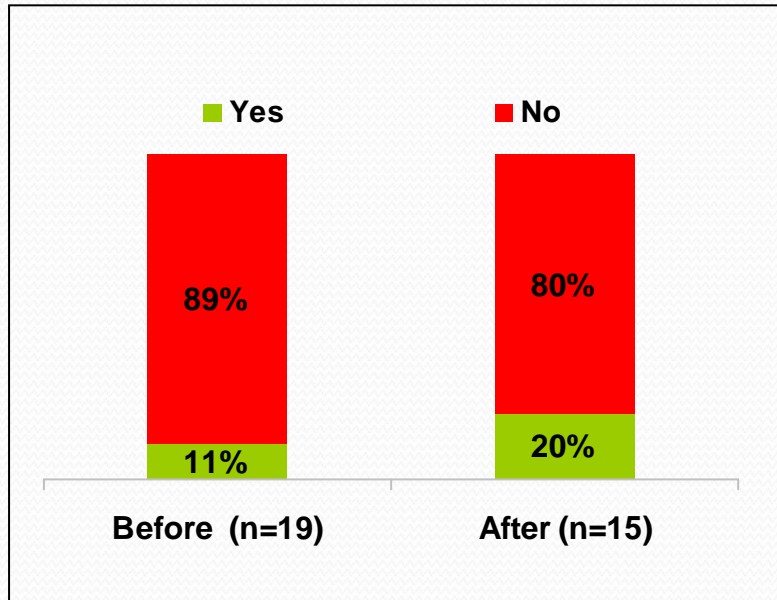
Intention to engage in energy saving activities

The majority intends to engage in energy saving activities. There is still resistance to change as regards activities that are more demanding (convenience or financially) from the standpoint of consumers: reduction of central heating usage, use of RES, roof ventilators, lighting timers installation, transportation by car, double glazers, and new frames and insulation installation.

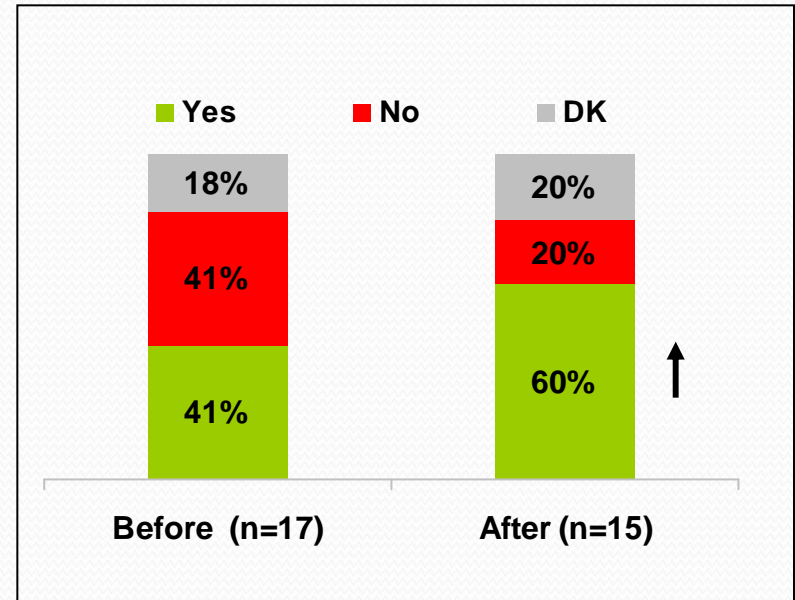


8 in 10 do not intend to join an environmental organization, however 6 in 10 are willing to pay more for electricity stemming from RES.

Join environmental organization



Pay more for electricity because it comes from RES



Summary

- The **main conclusion** is that the citizens of Amaroussion have in general a **positive attitude** for applying energy conservation and RES at individual level, but **lack of adequate information** and the **high cost** of related technologies are seen as main **barriers** by them.
- The remedies for this situation are the education on RES and EE at school level, the information through the Mass Media and the increase of public funding. Consequently, education of children at school but also pilot projects are the main actions proposed by the citizens to be taken at local level. This latter should be seriously taken into account by the local authorities of the Municipality.

- 92% of participants were influenced by the program concerning EE measures for the residential sector, 38.5% of which in a high or very high degree. More than 60% were influenced concerning RES measures for households and environmental issues.
- Concerning RES, the majority of citizens are more positive towards the application of solar thermal and PV systems at Municipality level, and PV systems and wind mills at national level.
- Concerning EE, it is very encouraging that citizens are familiar and support concepts such as “bioclimatic architecture”. They strongly support the improvement of infrastructure (street lighting, public transport) and EE measures for households at Municipality level.
- Concerning the future use/purchase of specific household electric appliances categories, the majority of citizens seem to be willing to improve their habits and behavior and believe that this program helped them towards this directions.