



Energy profile of the citizens of Amaroussion

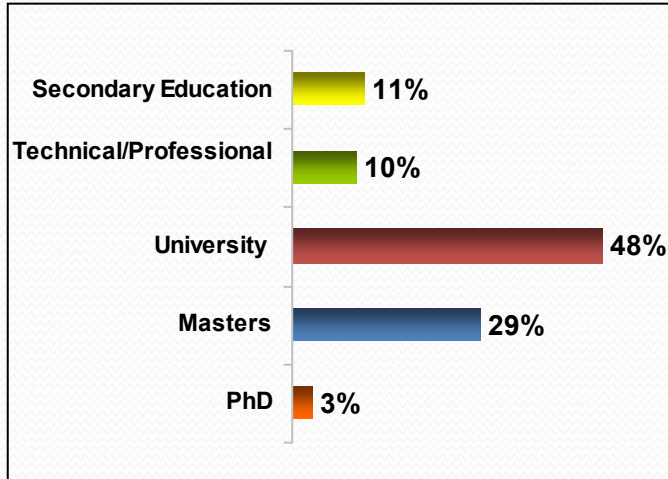
Results of 1st Questionnaire

December 2009

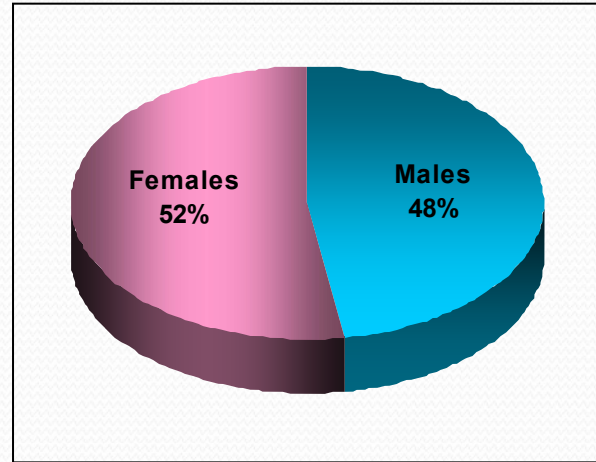
- The **main objective** of the current research is to obtain significant conclusions from the opinions of the citizens in the Amaroussion Municipality regarding the applicability of various energy saving and renewable energy techniques at home, problems and aspirations identified by public opinion and suggestions towards their resolution.

- It has been asked from **100 citizens** to complete a properly designed questionnaire.
 - **Effective sample: 63 participants** sent back the completed questionnaire back
- A smaller sample of **30 volunteers** participated in the recording of household electricity consumption which was conducted by CRES on behalf of the Municipal Development Company of the Municipality of Amaroussion (DEADA).
- As the questionnaire was self-completed, not all questions have been answered by the total number of participants

Educational level



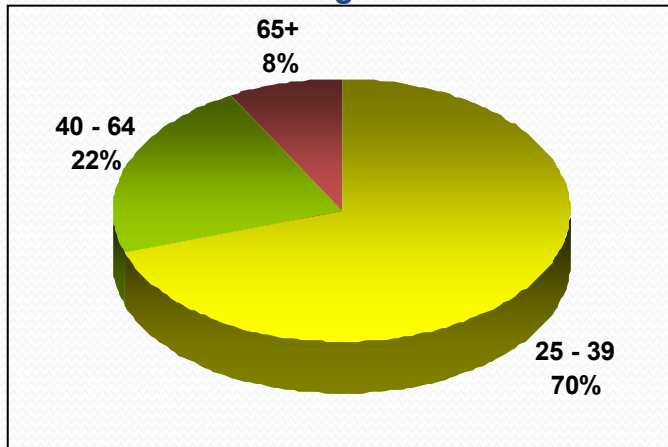
Gender



Stated Income (€/month)

- 500	-
501-1000	11%
1001-1500	20%
1501-2000	9%
2001-2500	16%
2501-3000	11%
3001-3500	11%
3501-4000	4%
4001-4500	-
4501-5000	-
5001-5500	4%
5501-6000	2%
6000+	11%

Age



General

No of people/households reached	63	
Average number of people per household	2,3	
Average children per household	1,5	
Ownership	owned	79%
	rented	21%

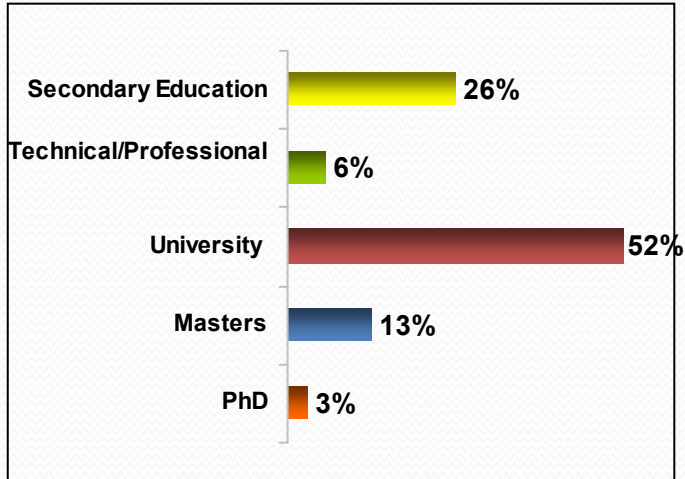
Year the residence was built

- 1944	2%
1945 - 1979	25%
1980 - 1999	40%
After 2000	33%

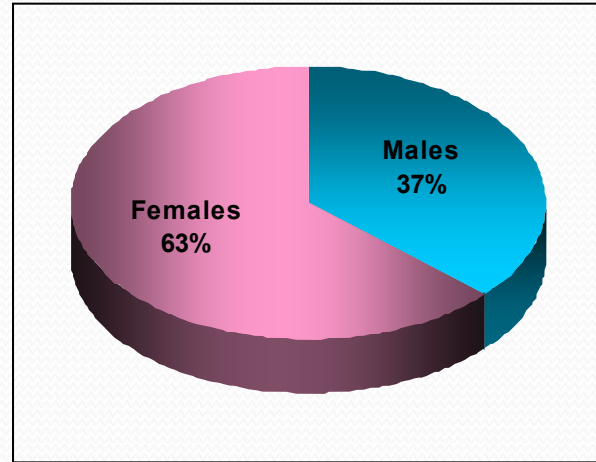
Sample characteristics: measuring campaign participants (n=30)



Educational level



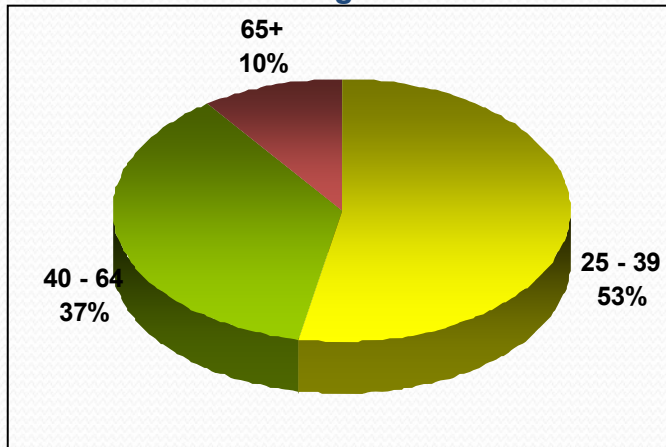
Gender



Stated Income (€/month)

- 500	-
501-1000	18%
1001-1500	5%
1501-2000	18%
2001-2500	23%
2501-3000	5%
3001-3500	23%
3501-4000	-
4001-4500	-
4501-5000	-
5001-5500	9%
5501-6000	-
6000+	-

Age



General

No of people/households reached	30	
Average number of people per household	2,9	
Average children per household	1,5	
Ownership	owned	71%
	rented	29%

Year the residence was built

- 1944	4%
1945 - 1979	11%
1980 - 1999	59%
After 2000	26%

Main Findings: measurement campaign

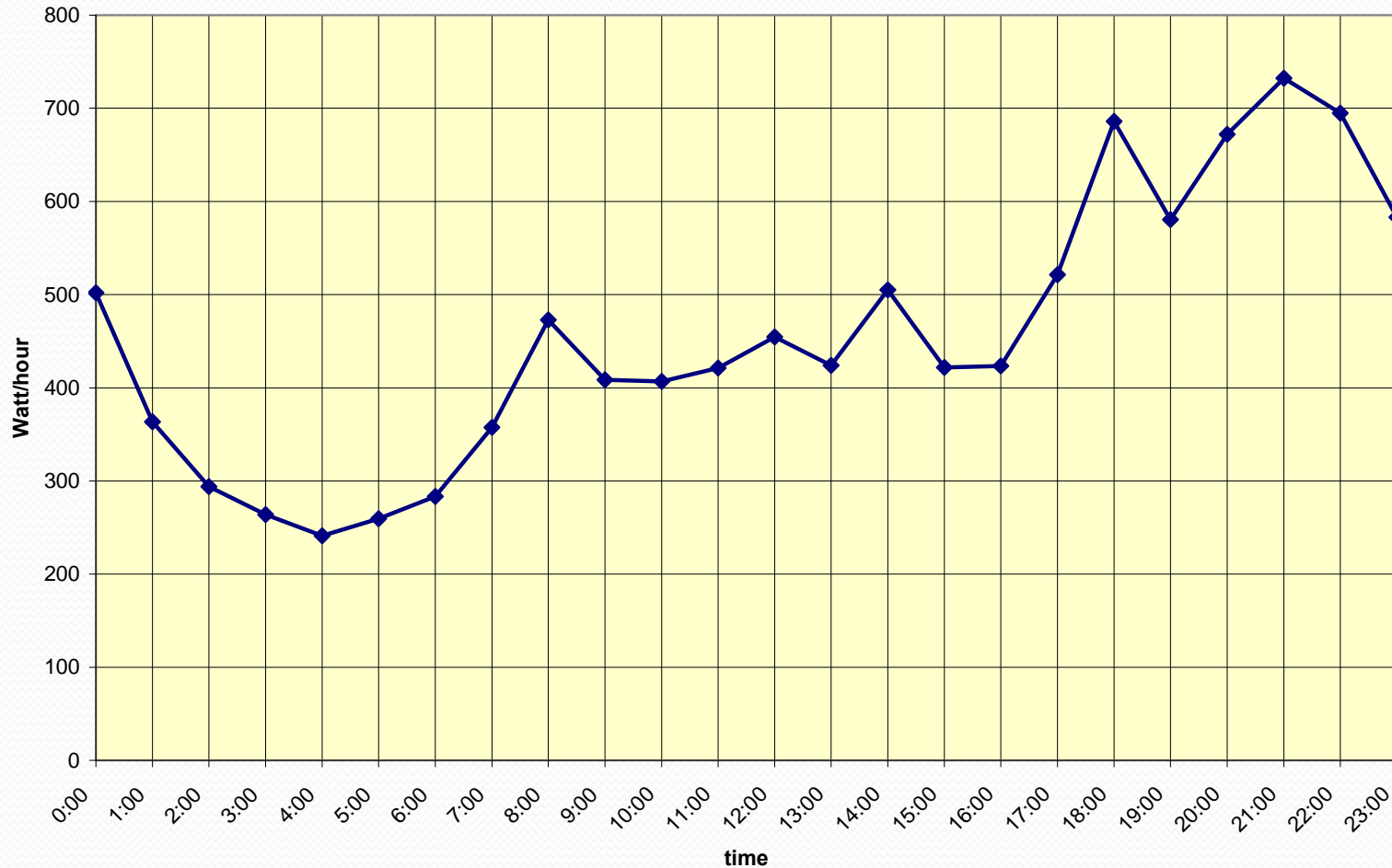
- RES: Renewable Energy Sources
- EE: Energy Efficiency
- Min: minimum
- Max: maximum
- TV: television
- DVD: Digital Video Disc
- PC: Personal Computer
- ECO: a prefix relating to ecological terms
- LAN: Local Area Network
- Hi Fi: High Fidelity (here referring to high-quality reproduction of sound by home stereos)
- LCD: Liquid Crystal Display (here referring to TV)
- PV: photovoltaic

Hourly power consumption profile for the average day of the sample



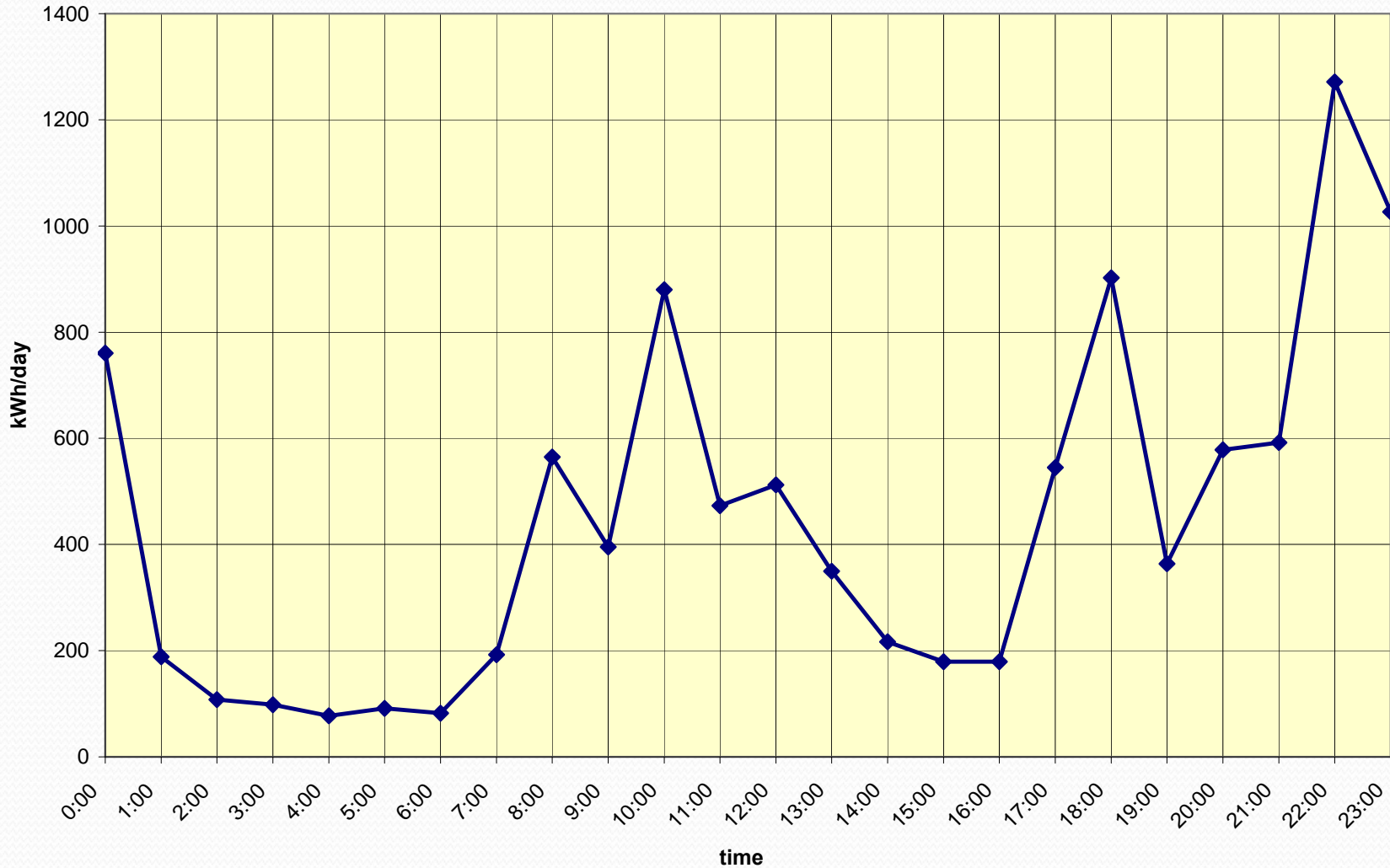
The lowest values are observed during nighttime from 24:00 to 06:00, followed by a peak value at ~8:00 in the morning (morning activities) and a second peak around 14:00-15:00 (cooking activities). The max power consumption can be found during afternoon and evening hours until 23:00 (residents at home).

Power Consumption Profile - Average Day of the sample



Profile similar to the previous one, presenting increased energy demand in the afternoon and morning hours and lower energy demand during the night (24:00 – 07:00).

Daily energy consumption profile - Typical dwelling in the sample

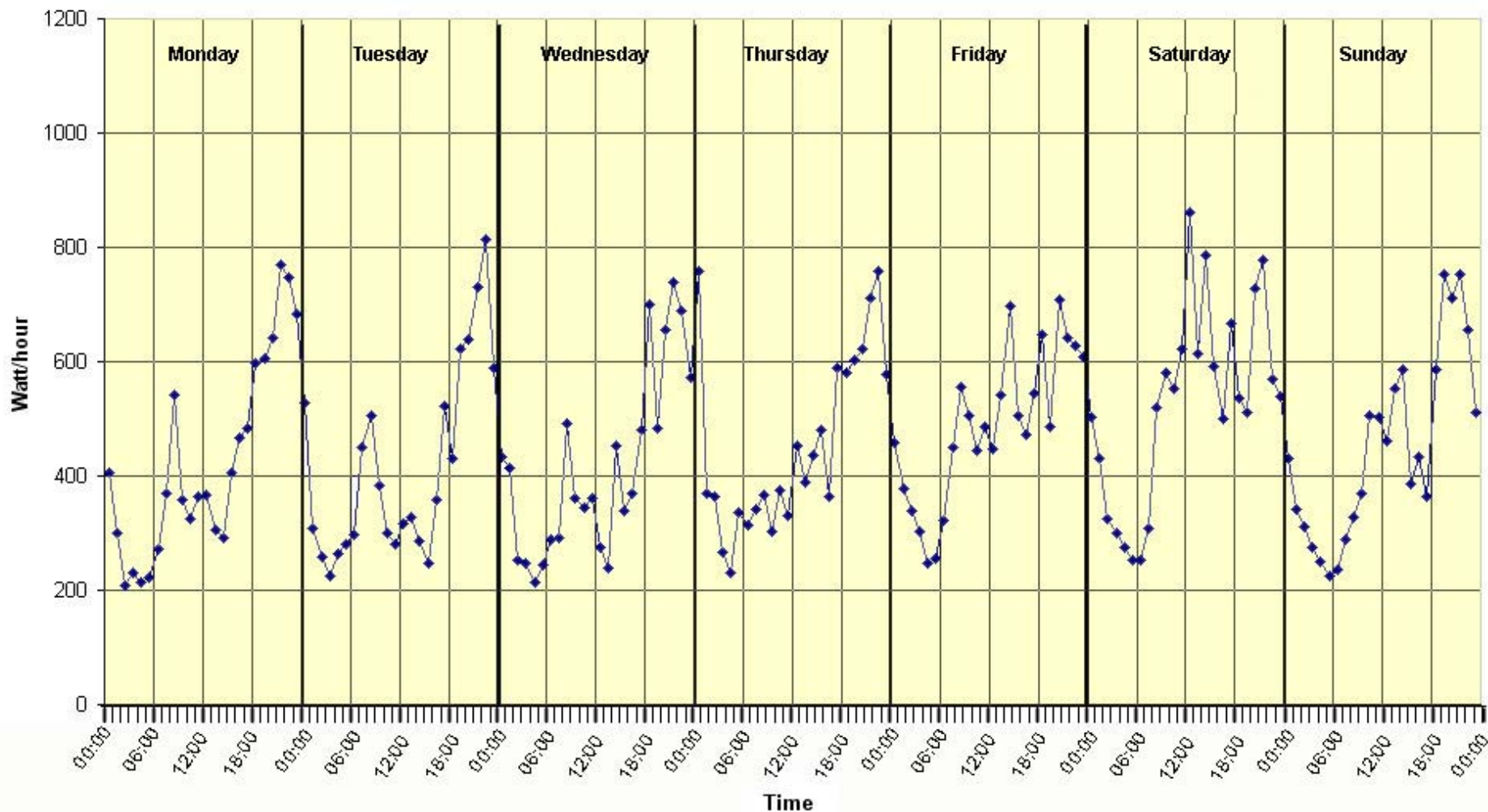


Hourly power consumption profile for the average week

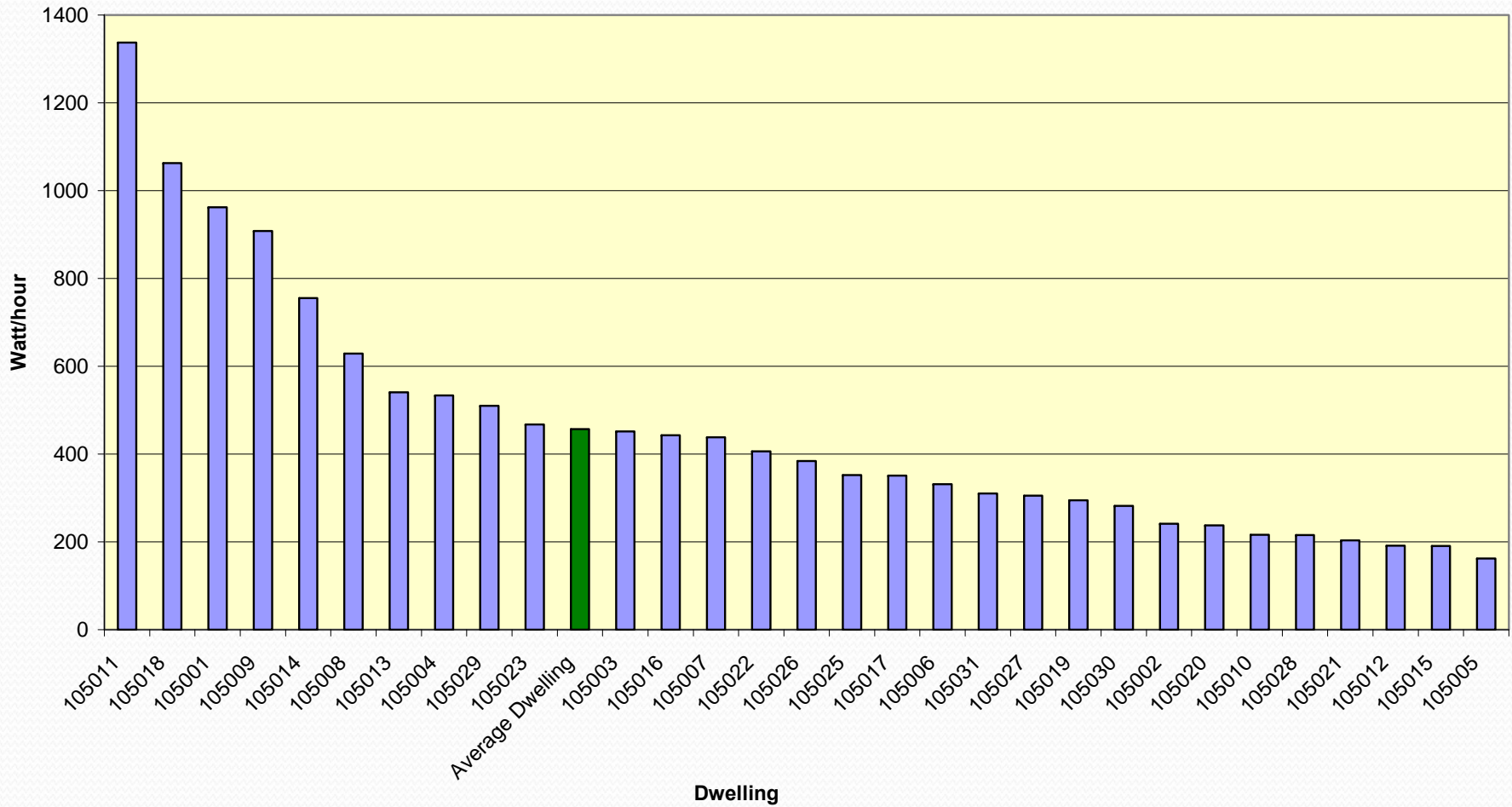


There is a slight differentiation between working days and weekends, with a special increase on Saturday in the morning hours (09:00-14:00).

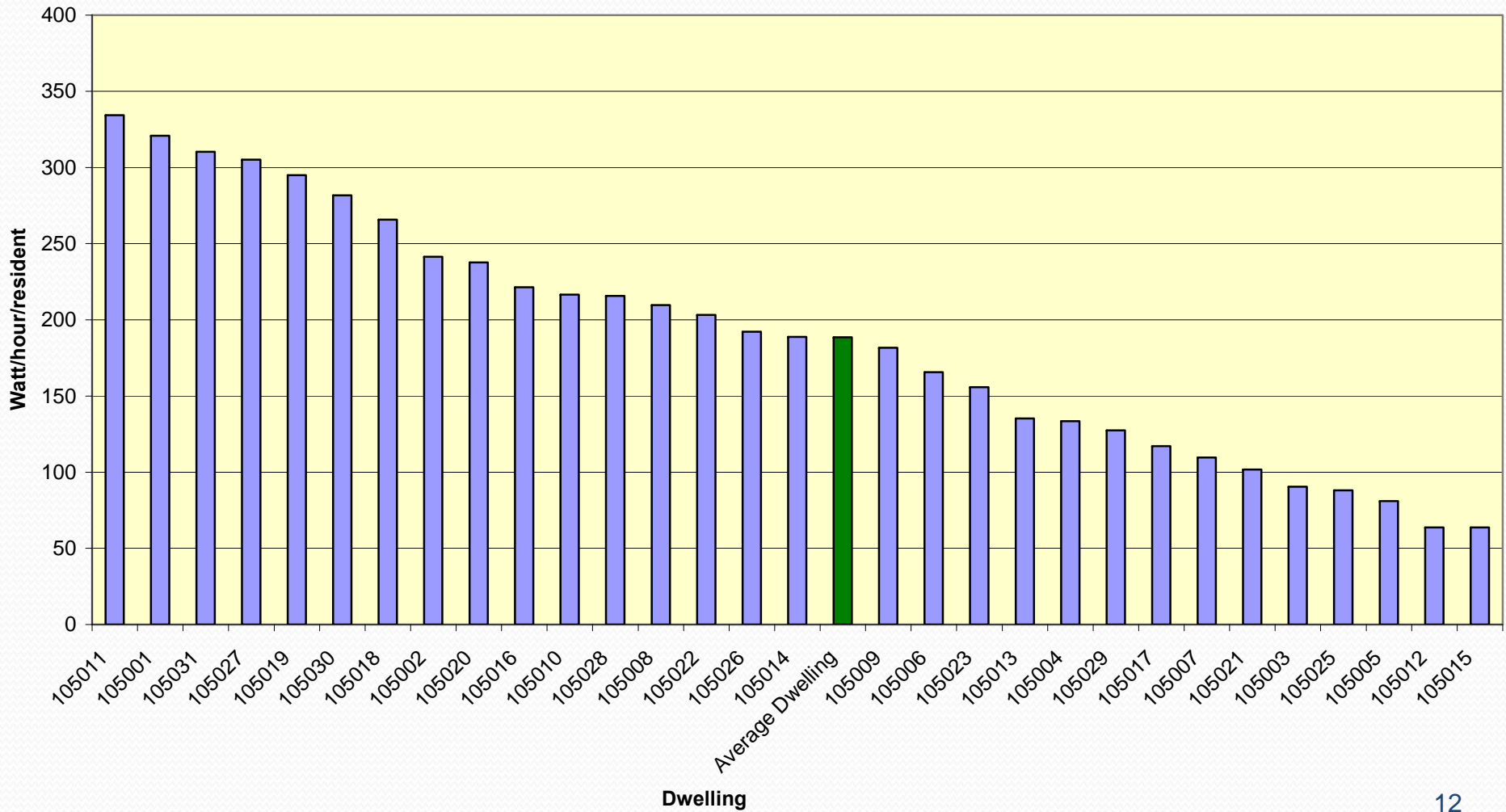
Mean weekly Power Consumption per hour for the Average Dwelling of the sample



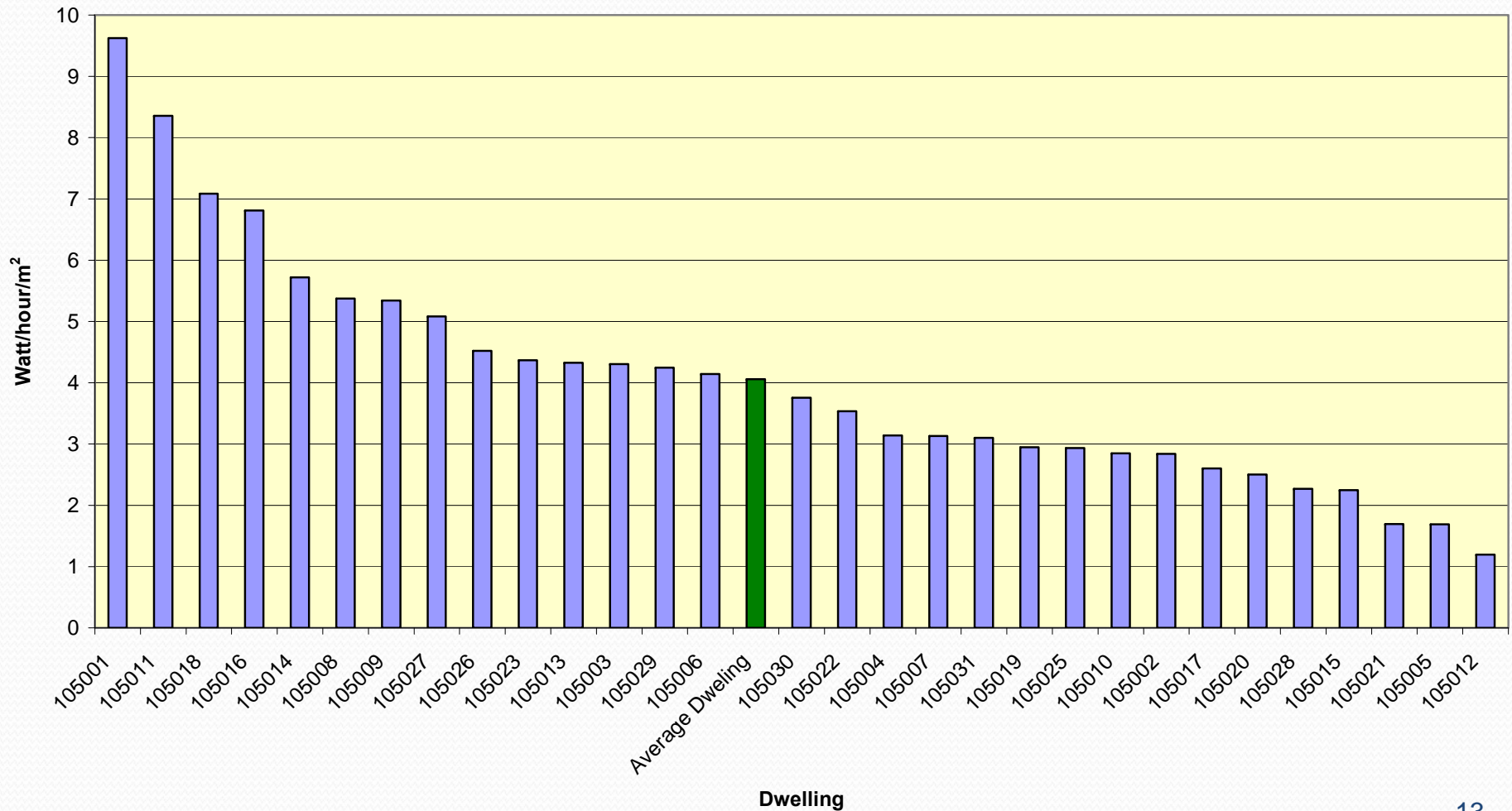
Mean hourly Power



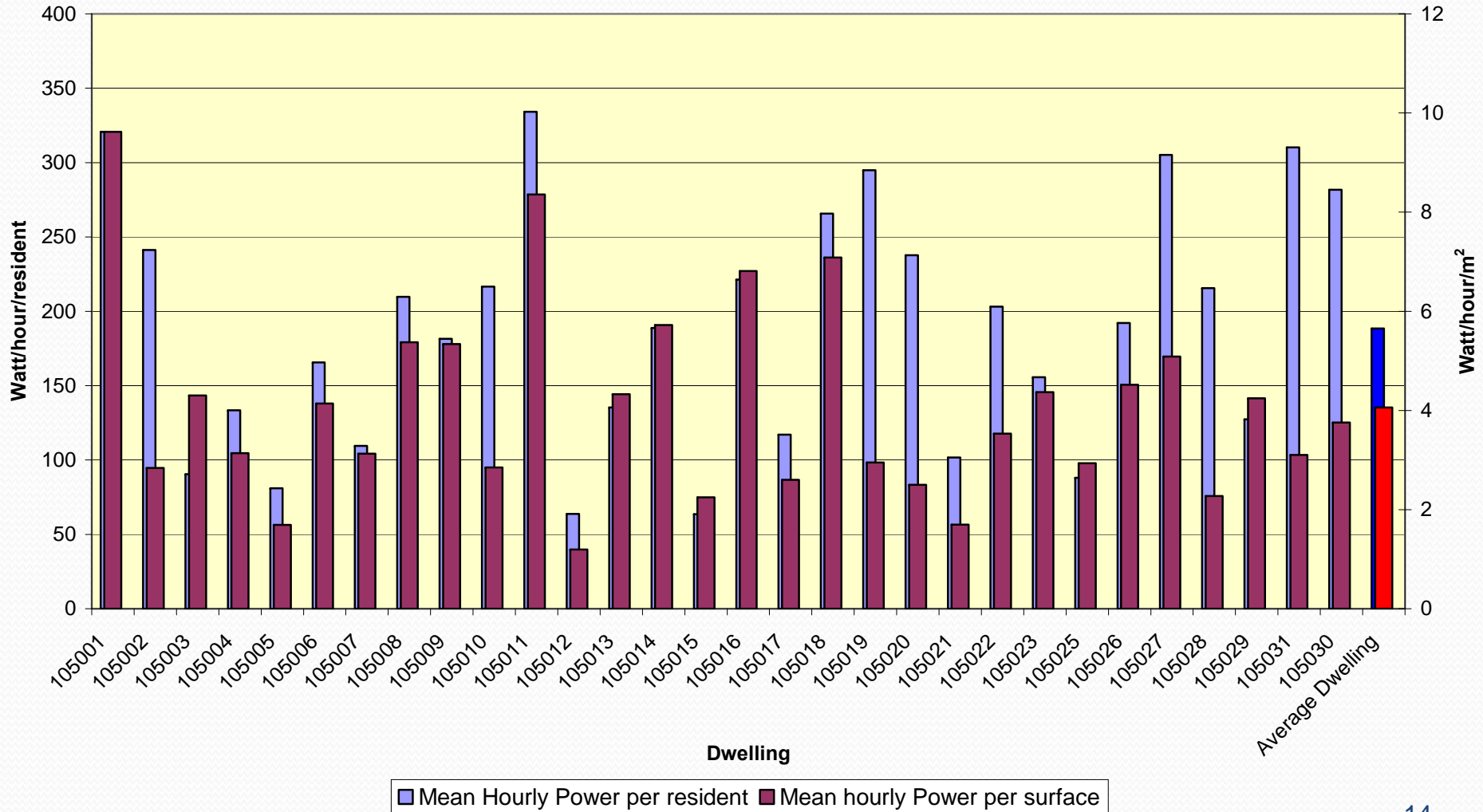
Mean hourly power per resident



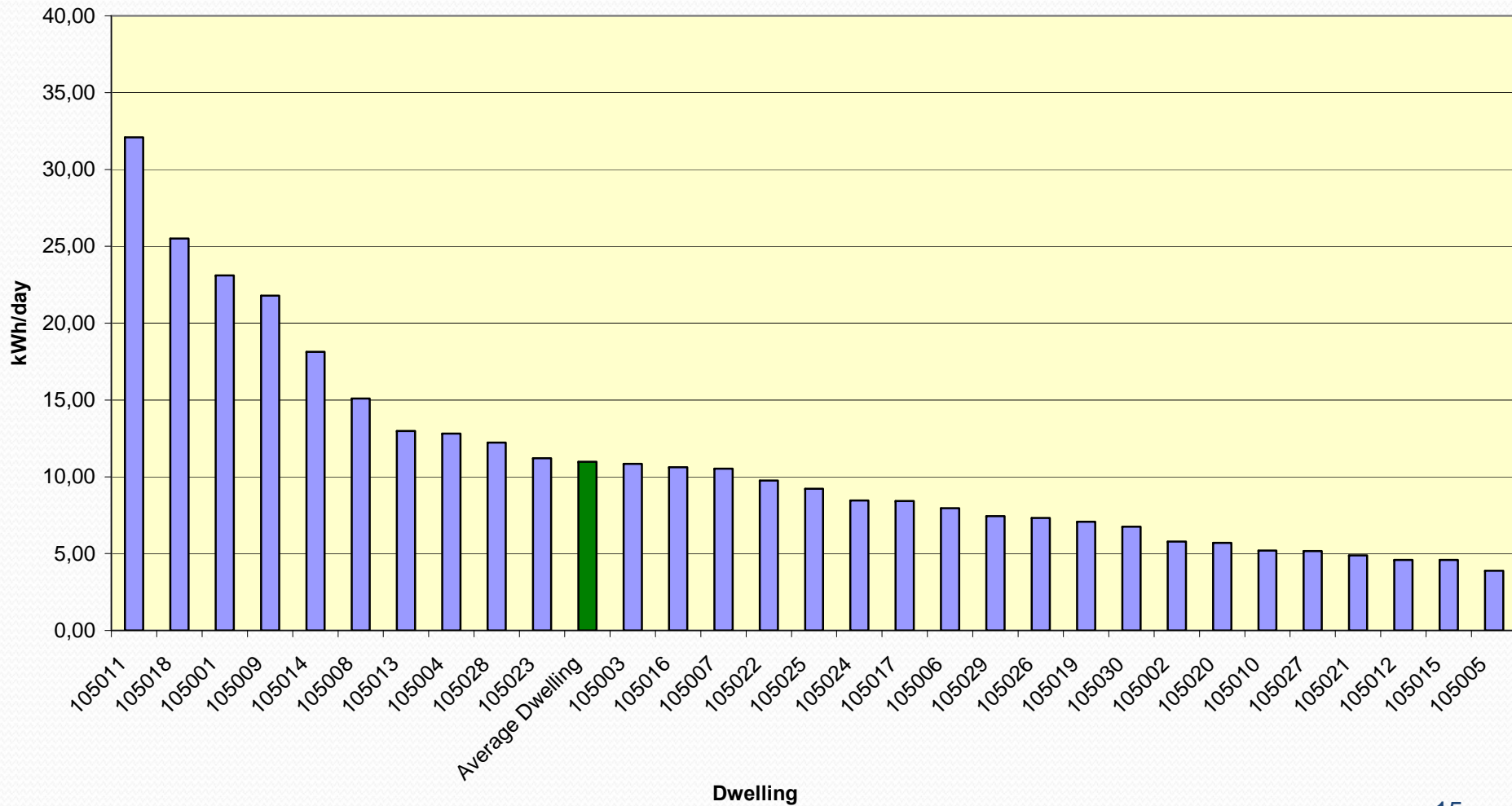
Mean hourly Power per surface (m²)



Mean hourly Power consumption per resident and per surface



Mean daily energy consumption



The mean yearly electricity consumption of a household was calculated to be 4.005kWh/year/household and the mean yearly electricity consumption per resident was 1.651kWh/year/resident. The mean yearly energy saving per household is estimated to be 1.001kWh /year/household.

	Average Dwelling of the sample		
	Mean value	Min value	Max value
Mean daily power (Watt/hour/day)	457	162	1.337
Mean hourly power per resident (Watt/hour/resident)	188	63,6	334
Mean hourly power per surface (Watt/hour/m ²)	4,06	1,19	9,62
Mean daily energy consumption (kWh/day)	11,0	3,89	32,1
Mean yearly energy consumption (kWh/year)	4.005	1.420	11.713
Residents	2,7	1	5
Surface (m ²)	111	60	170

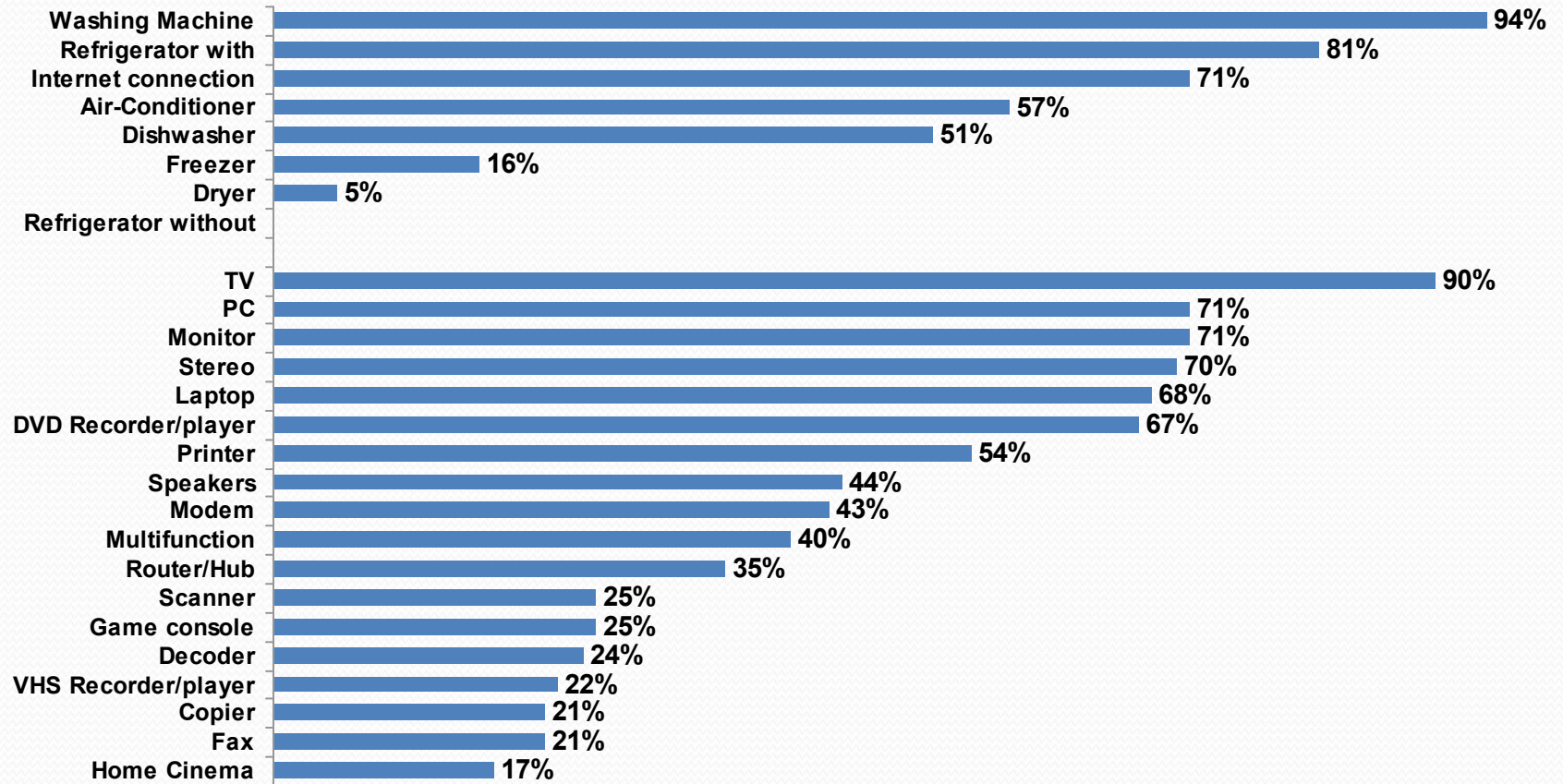
Main Findings: questionnaire analysis

Residential consumption

	n	Mean
Electricity consumption		
€	33	716 €
kWh	8	4169 kWh*
Oil or natural gas consumption		
€	25	498 €
Liters	2	1200 lt
m ³	1	800 m ³

*** Slightly higher than the mean yearly electricity consumption of a household as calculated using the measured values of the measuring campaign (4.005kWh/year/household).**

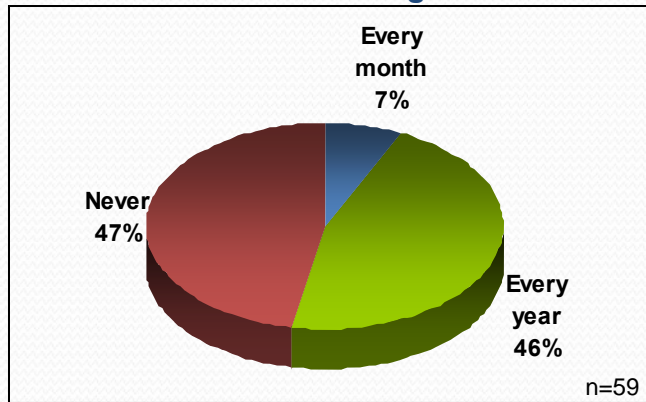
Most respondents possess a washing machine, a refrigerator and a TV (>80%). More than half own a stereo, a DVD recorder/player, a printer, a laptop, a monitor, a PC, an air-conditioner, an internet connection and a dishwasher.



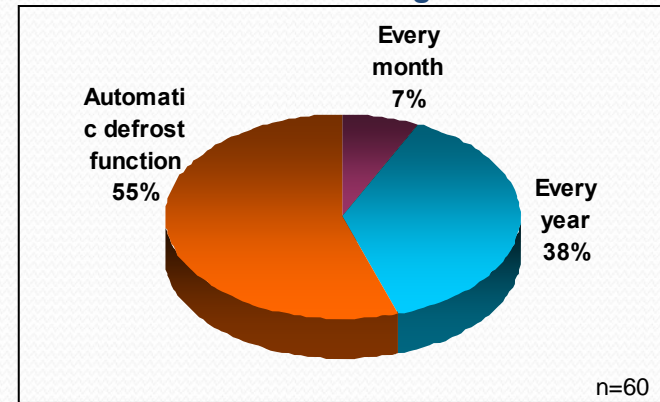
Almost half clean the grid on the back of the refrigerator once a year and half never clean it; it seems that they do not know the usefulness of this action. Most refrigerators have an automatic defrost operation and the other are being defrosted basically once a year. Refrigerators usually operate in the middle temperature and are located away from cooking appliances.

Average storage capacity: 384 lt

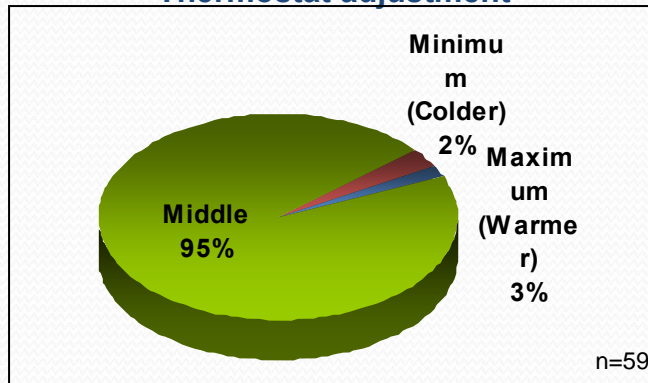
Grid cleaning



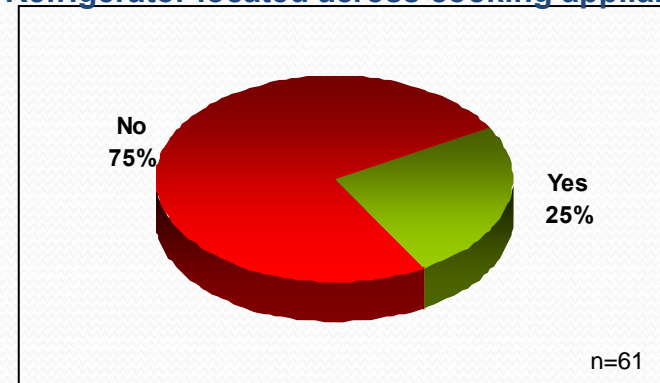
Defrosting



Thermostat adjustment



Refrigerator located across cooking appliance



How often do you clean the grid at the back of the refrigerator? / defrost?

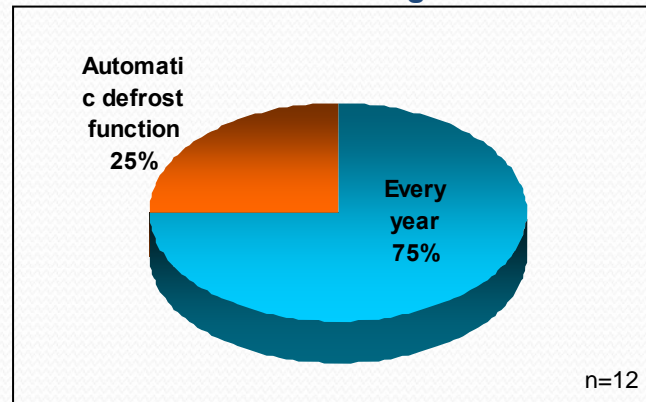
How do you adjust the thermostat?

Is your refrigerator is located across a cooking appliance?

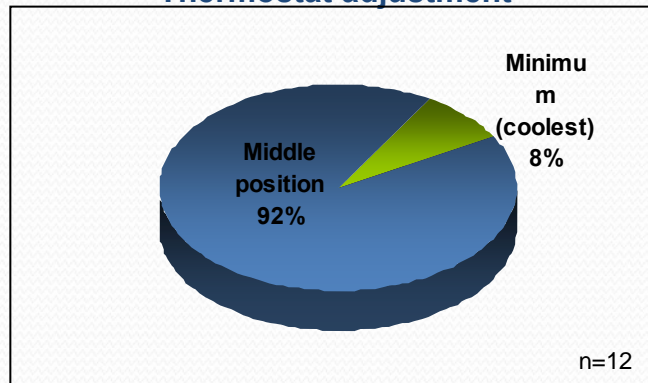
3 in 4 freezers do not have a automatic defrost operation and are being defrosted once a year. The thermostat is set to middle position. Most freezers are placed away from cooking appliances

Average storage capacity: 115 lt

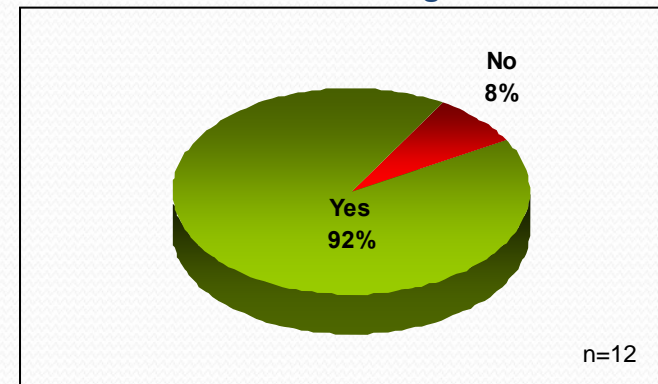
Defrosting



Thermostat adjustment



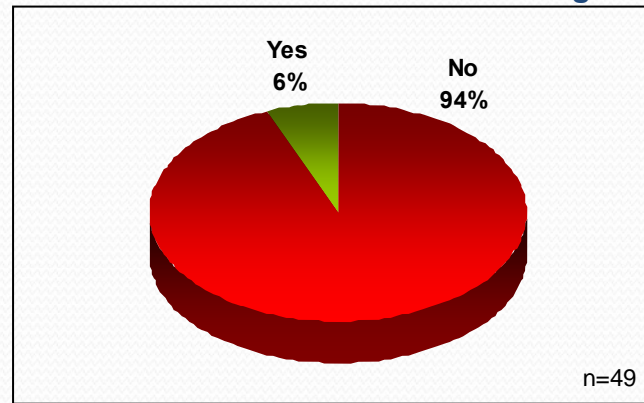
Location of refrigerator



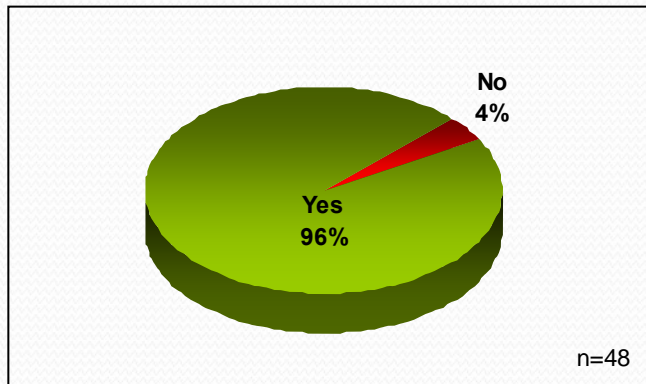
How often do you defrost the freezer(s)?
 How do you adjust the thermostat?
 Is your freezer is located across a cooking appliance?

The majority of respondents do not place hot food in the fridge / freezer. Only 4% place uncovered utensils in the fridge / freezer. 74% are checking the energy label before buying a new refrigerator or a freezer.

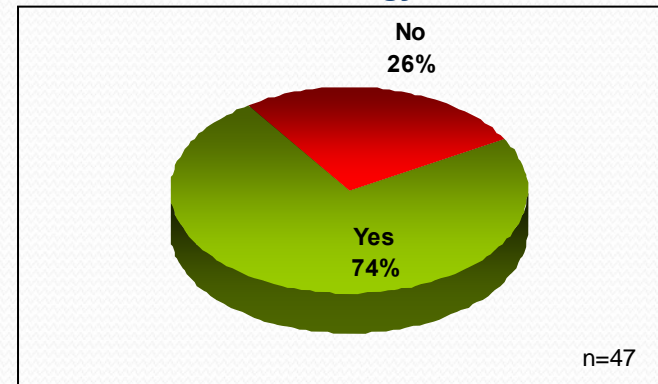
Put cooked food before cooling



Cover dishes

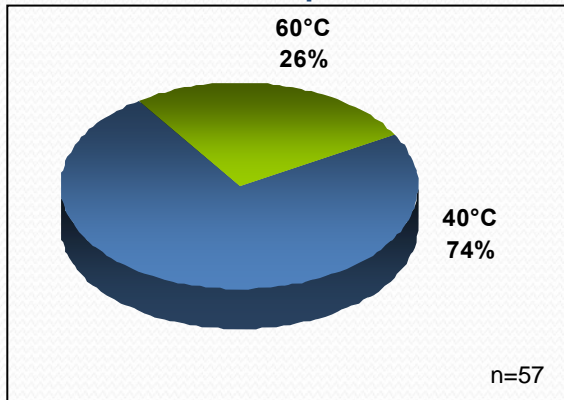


Check energy label

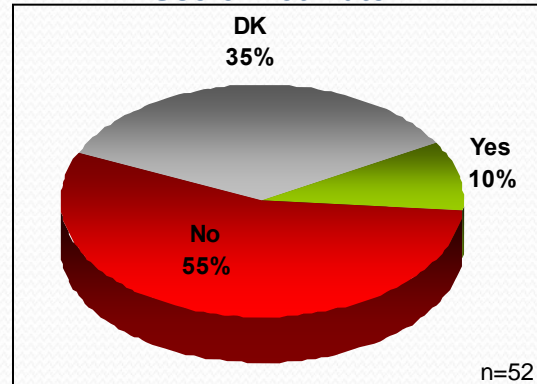


Most respondents tend to fill their washing machine at ~75% of their volume. None of them is using a washing temperature of >60° C, with the most washing at 40° C. Half washing machines do not have an ECO button and these that have one are not always operated in the economy mode by the users. The vast majority does not fold the clothes before putting them in the washing machine. Few are these that supply the washing machine with warm water

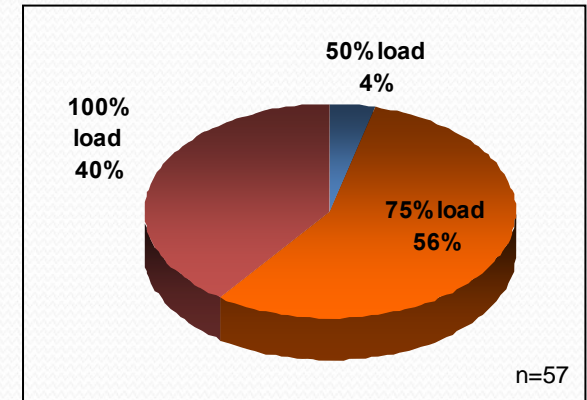
Water temperature



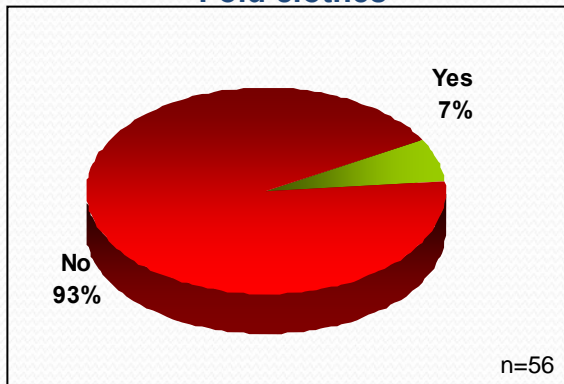
Use of hot water



Load

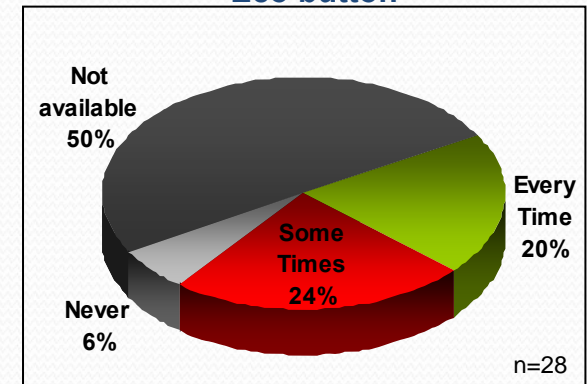


Fold clothes

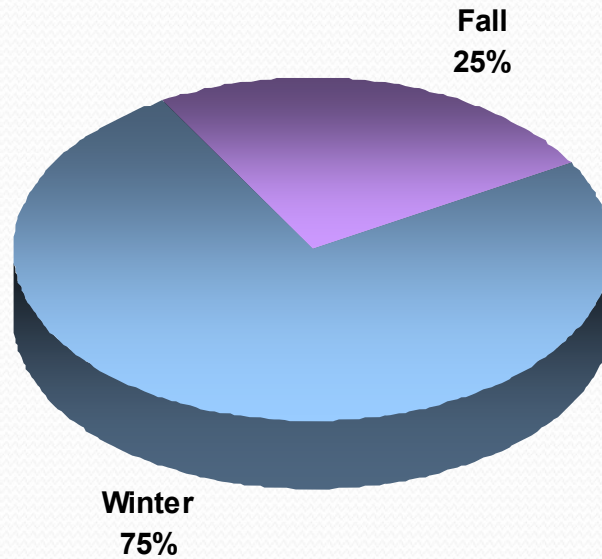


	n	Cycles / minute
Cotton	13	754
Synthetics	12	658
Sensitives	8	488

Eco button

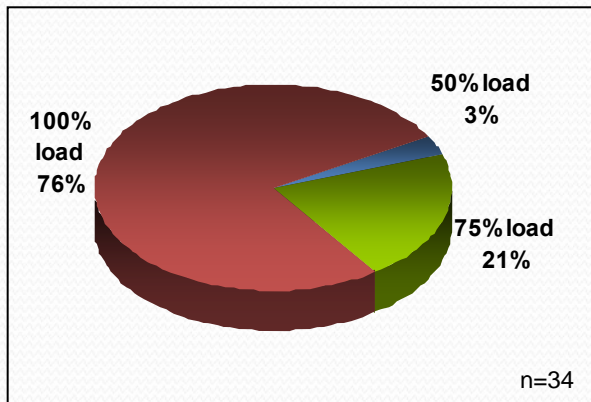


The frequency of dryer usage is a function of sunlight: it is mainly used during Winter and secondarily during the Fall.

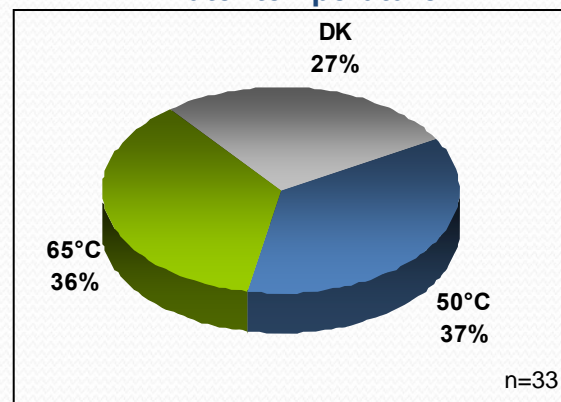


Most try to fill their dishwashers. The washing temperature varies. Only 12% are sure that their dishwasher is supplied with preheated water. A substantial proportion is using the ECO button (if it exists) in their systems. 72% checked the energy label of their dishwasher when buying it.

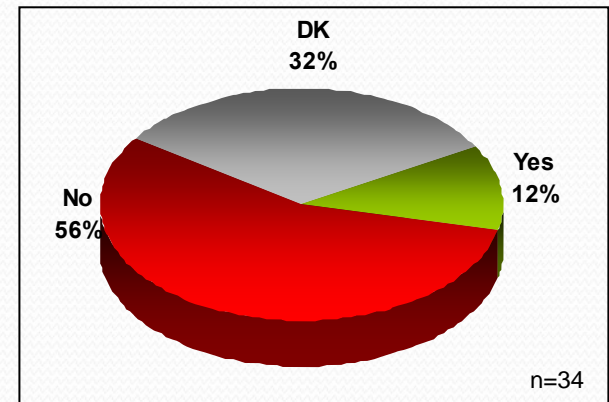
Load



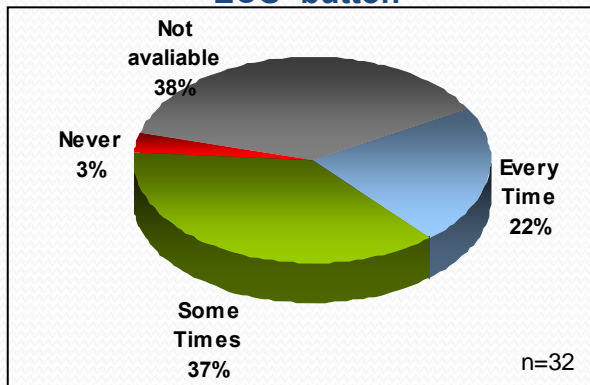
Water temperature



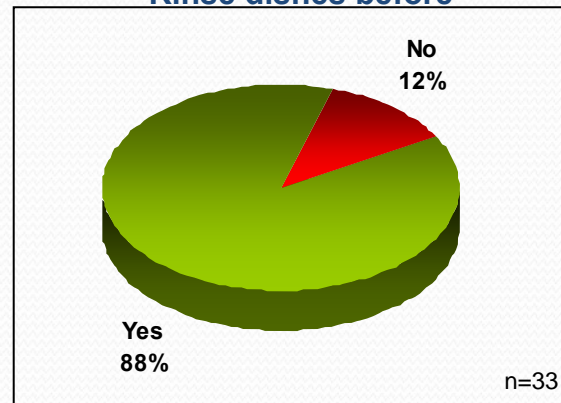
Feed hot water



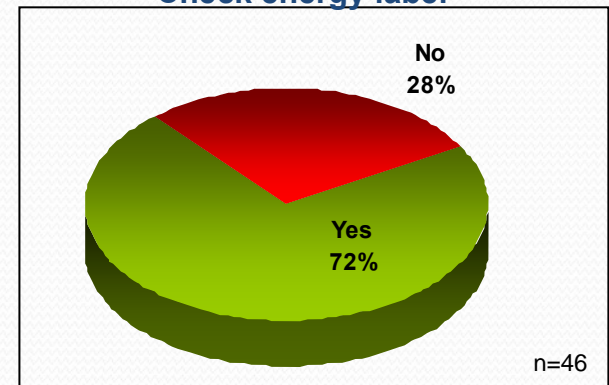
ECO button



Rinse dishes before

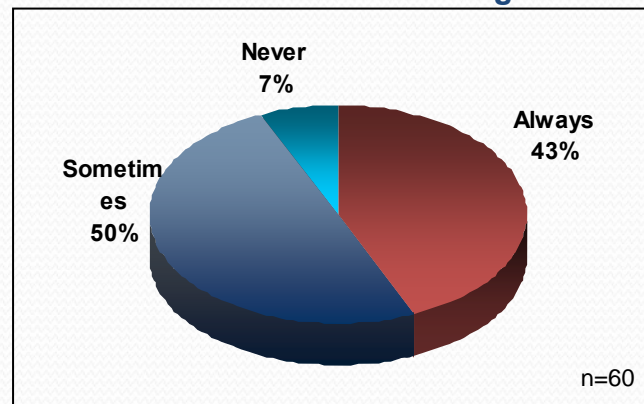


Check energy label

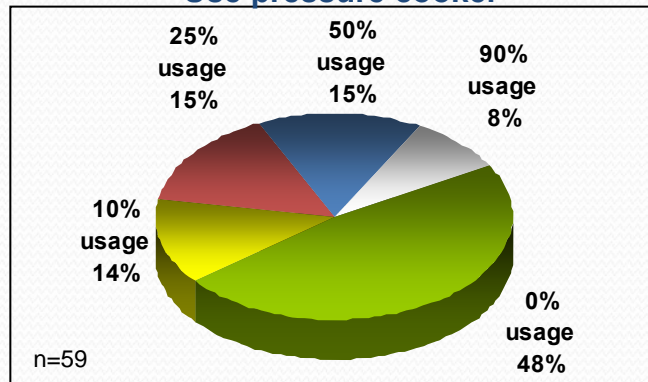


The defrosting of food is being done usually at room temperature. Most cover the utensils with lid during cooking. Almost half of respondents do not use pressure cooker.

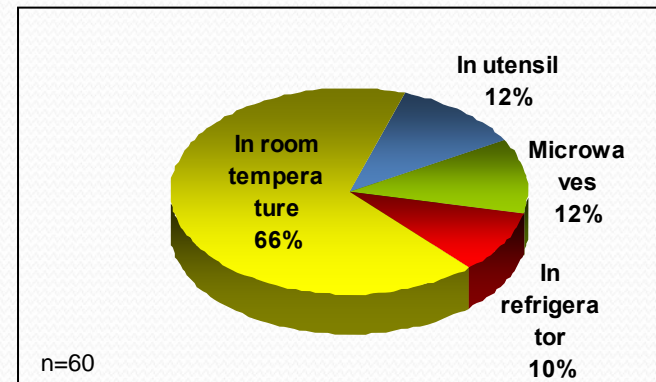
Put lid while cooking



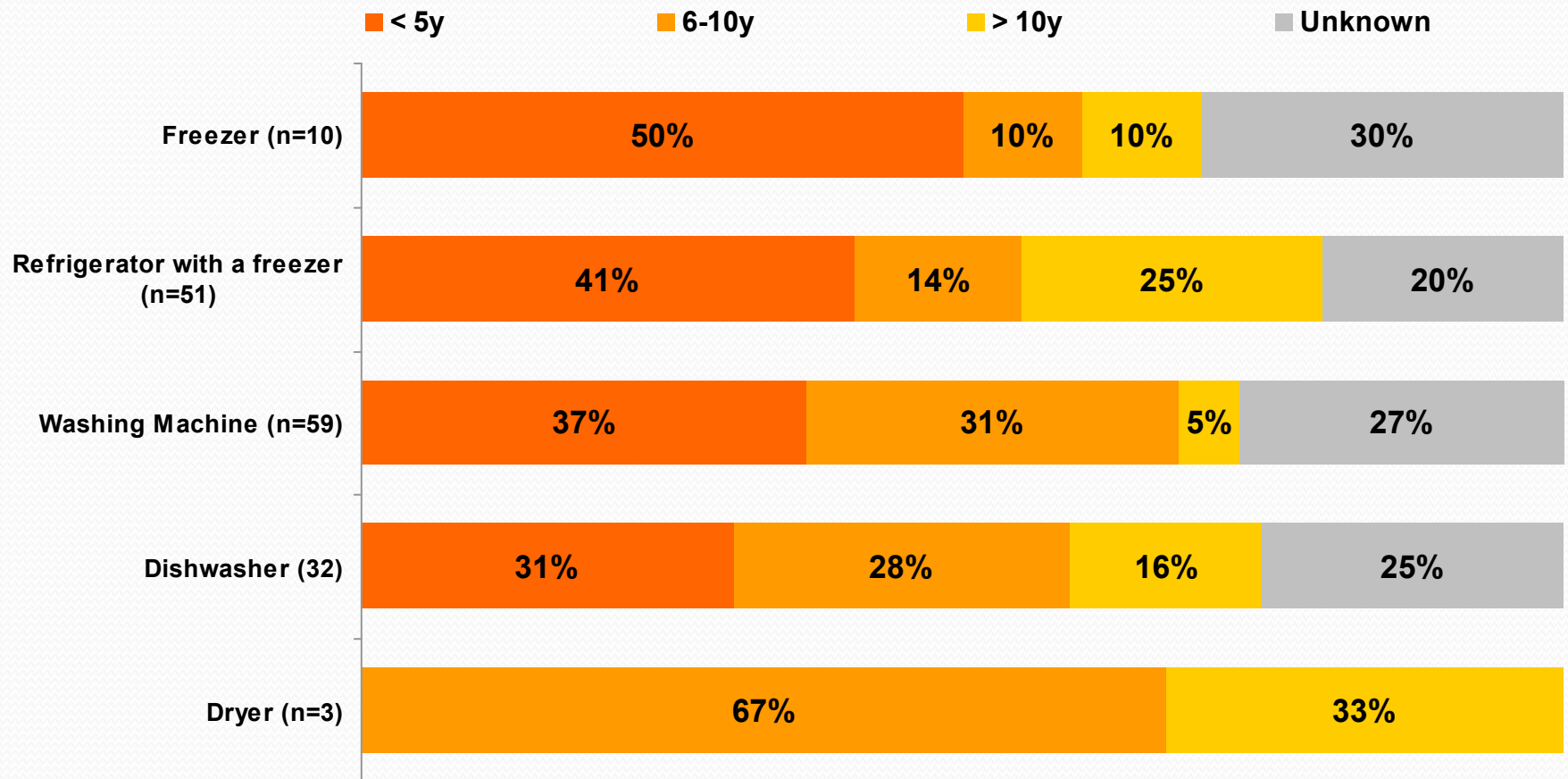
Use pressure cooker



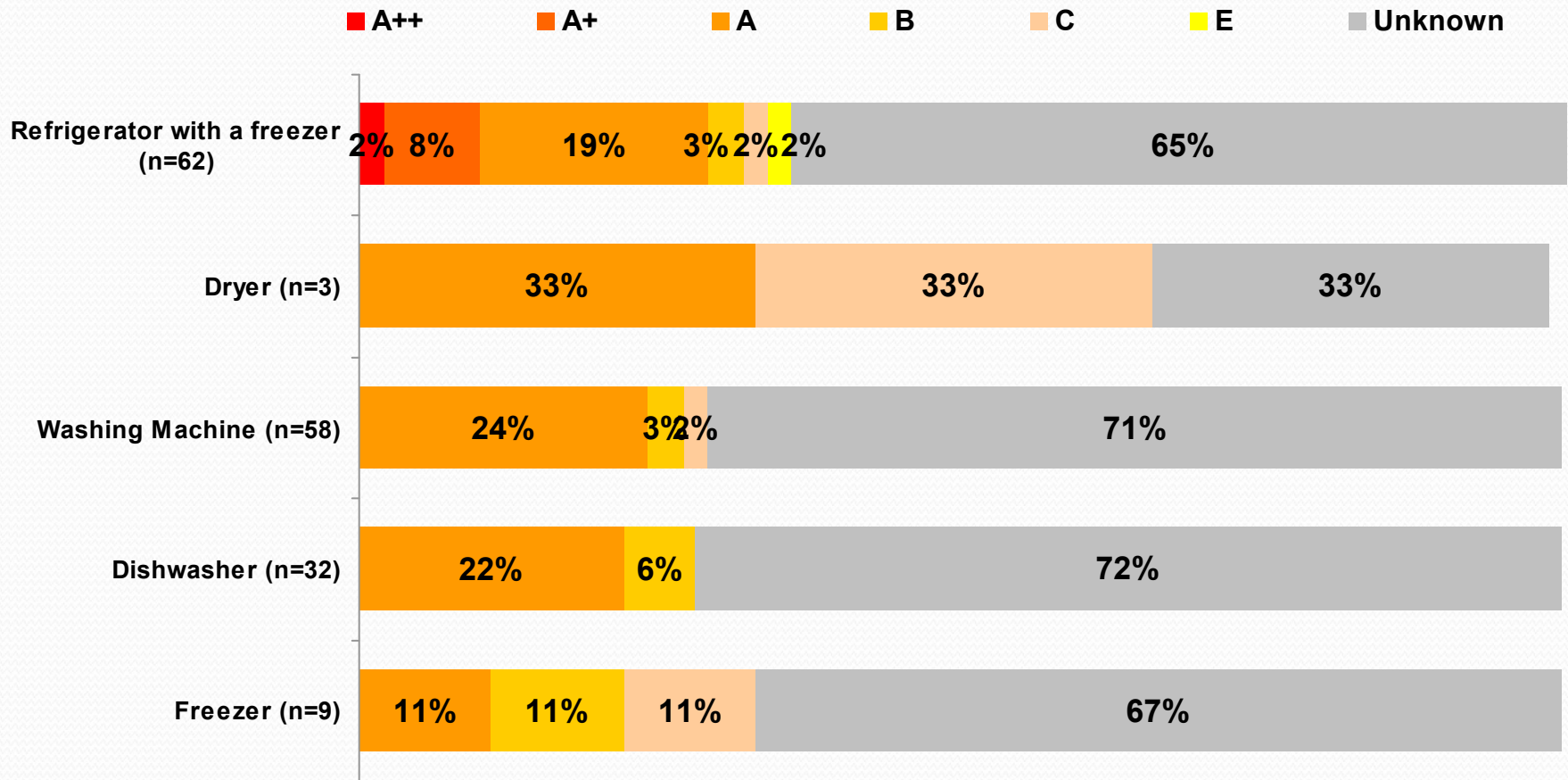
Defrost food



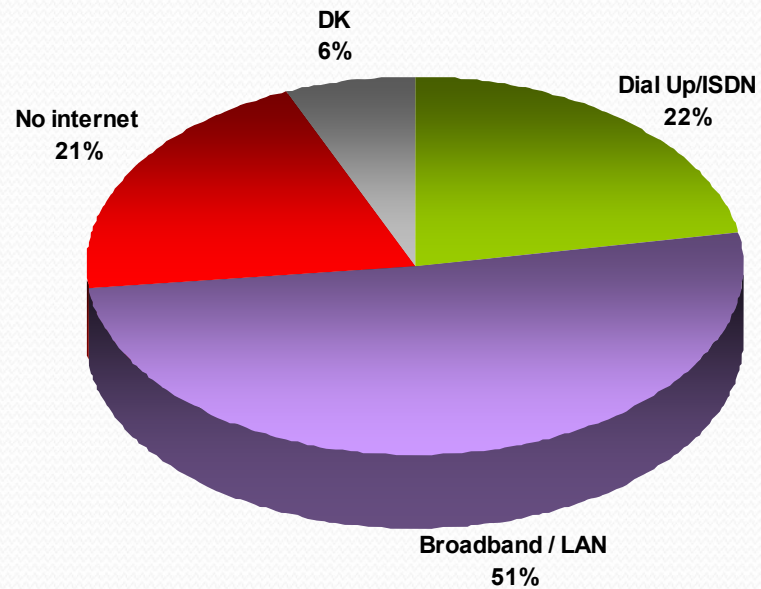
Freezers are the younger electric household appliances and dryers the oldest (though owned by only 4.8%).



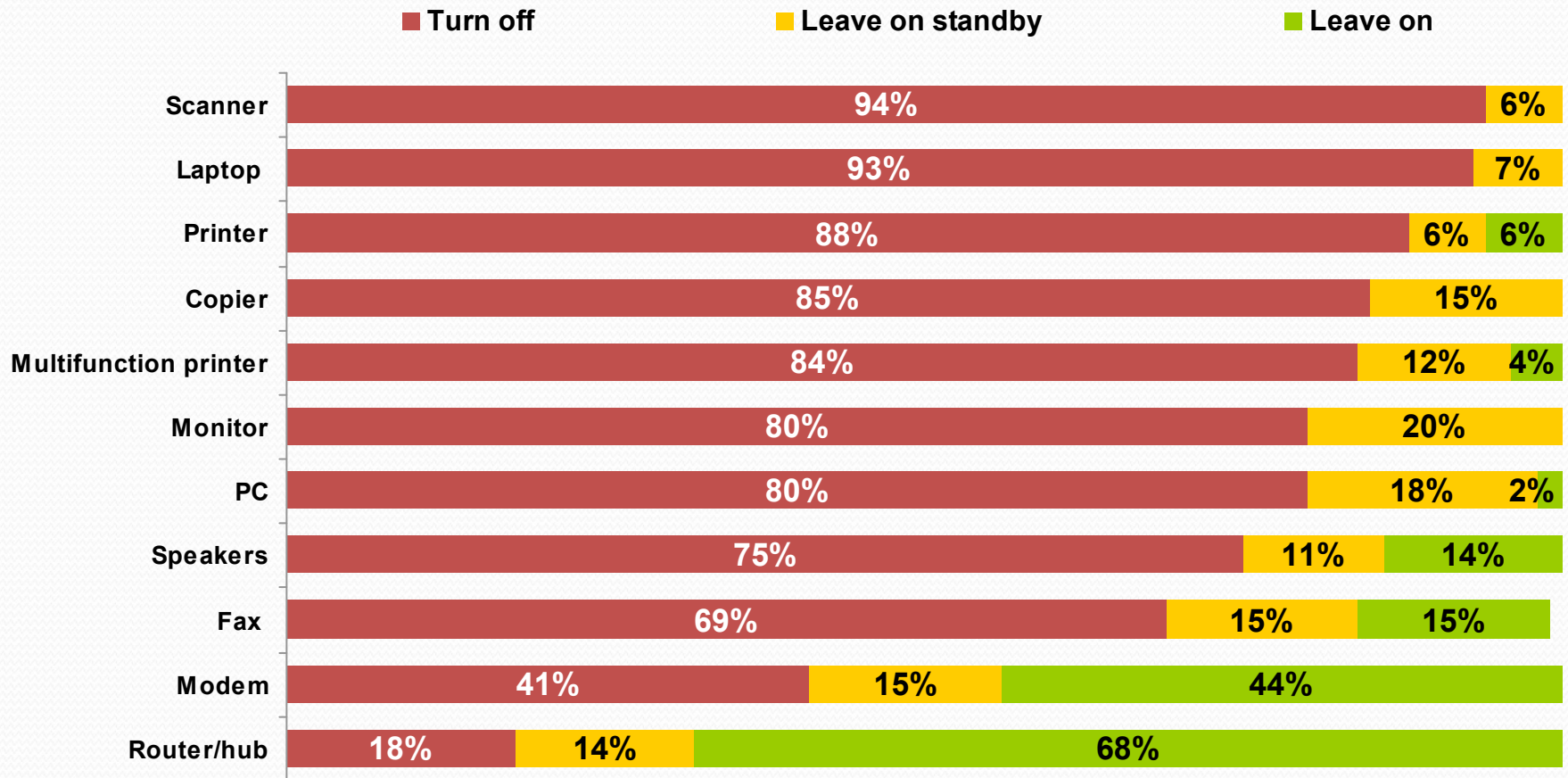
Energy classes A++ and A+ are found only at 1 out of 10 refrigerators, while quite a few are not aware of the exact energy class of the appliances.



2 in 10 do not have an internet connection. Half have gone broadband / LAN.

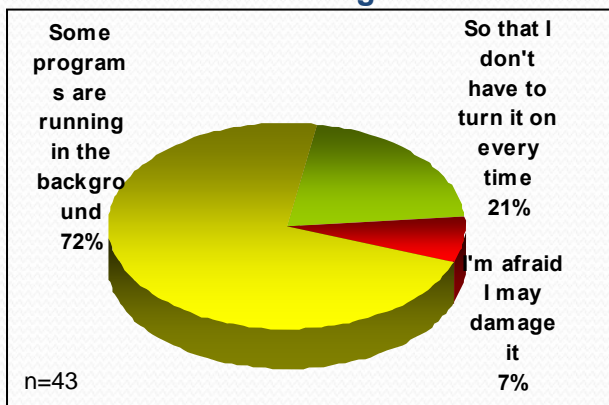


Most of the office appliances are mainly turned off, except the fax, the modem and the router, as they constitute communication equipment.

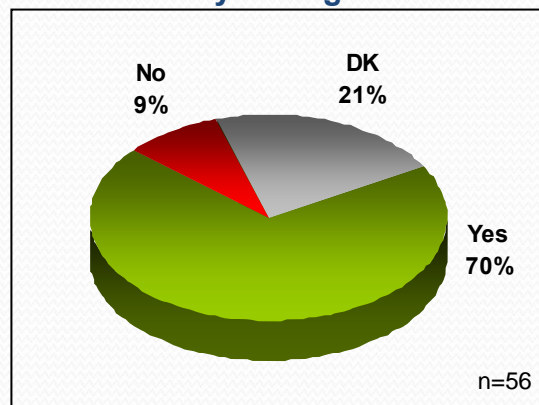


The main reason not turning off the PC is because programs are still running. Circa 7 in 10 activate the electricity saving handler on their monitors and desktops, albeit 2 in 10 are not aware of the electricity saving function. 3 in 10 do not know what “energy star” means, let alone purchase such an appliance. Alarmingly, half believe that the screen saver does not save energy.

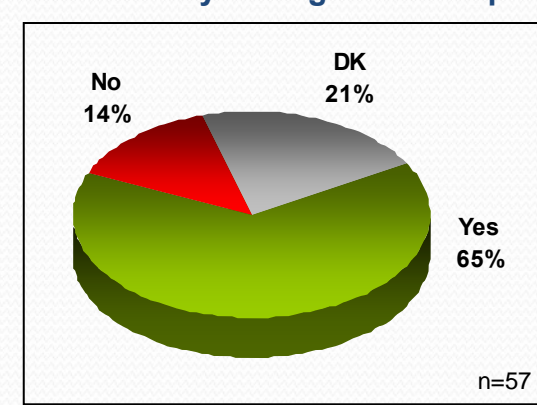
Reasons not turning off the PC



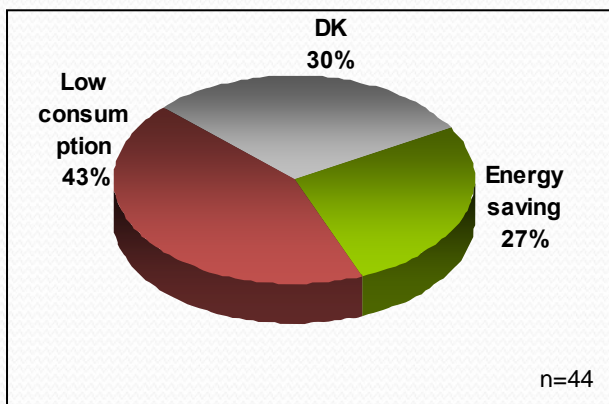
Electricity saving on monitor



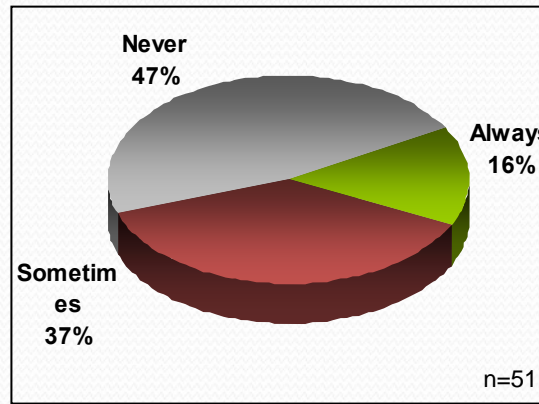
Electricity saving on desktop



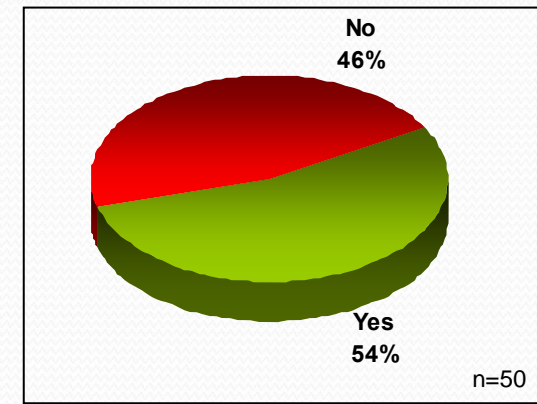
Energy star label meaning



Energy star purchase

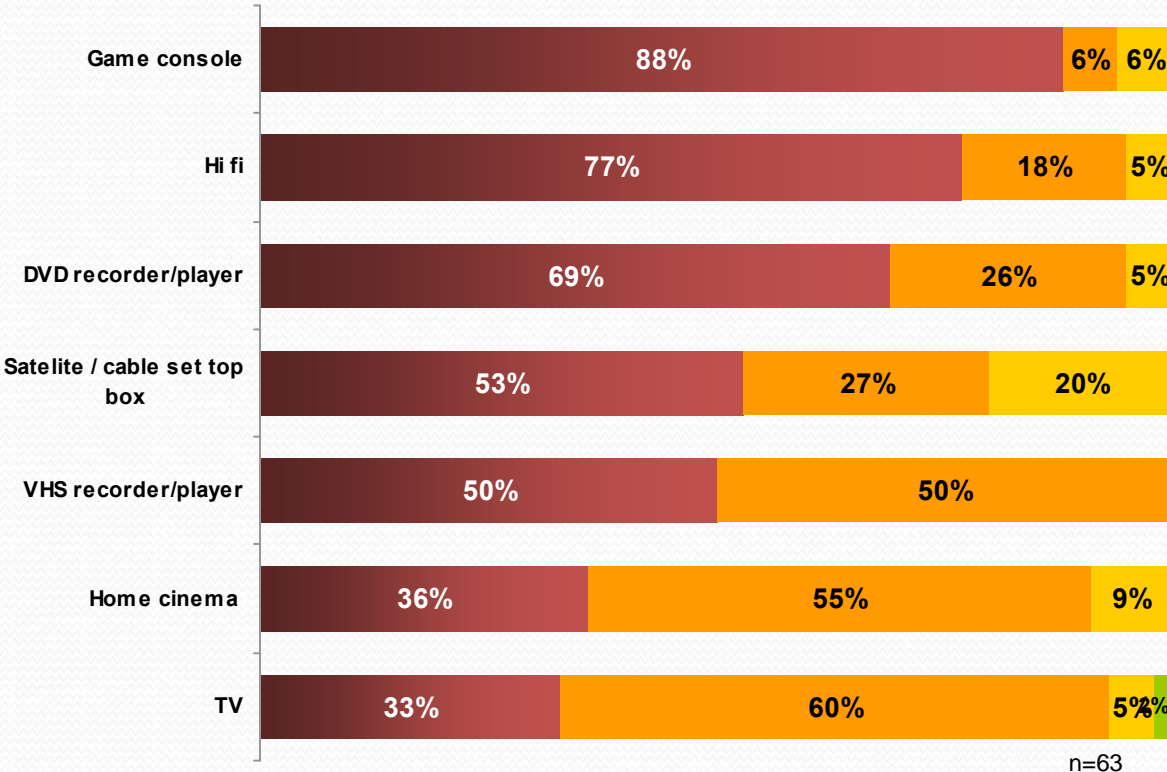


Screen saver saving energy

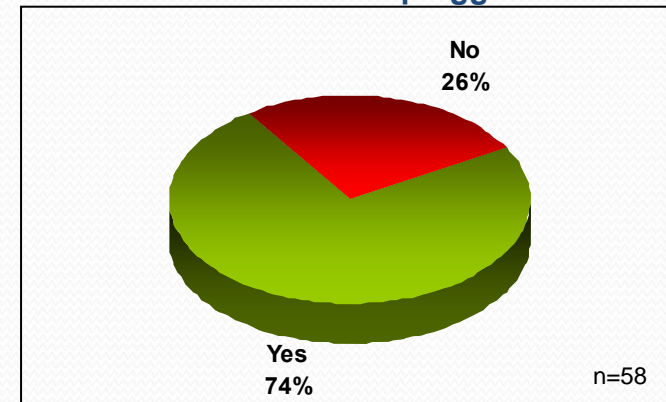


The game console, the Hi Fi and the DVD player are mostly turned off (on/off button), however citizens do not exhibit an energy saving behavior regarding the rest appliances. This is despite the fact that 3 in 4 are well aware of the ease with which some appliances consume electricity.

■ Turn off (on/off button) ■ Turn off (remote control) ■ Stand by mode ■ Leave on



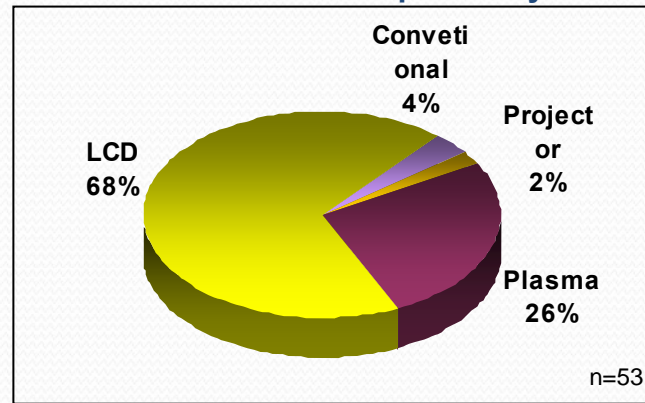
Awareness of electricity usage when turned off but not unplugged



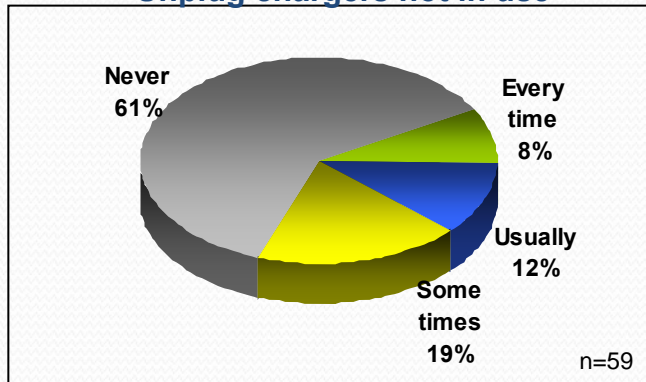
When not using the following appliances, do you...
Do you know that some appliances use up electricity even if they are turned off but not unplugged?

7 in 10 would replace their current TV set with an LCD screen. 6 in 10 never unplug the chargers when not using them and 4 in 10 do not use multiple sockets with a switch that can be disconnected from the mains.

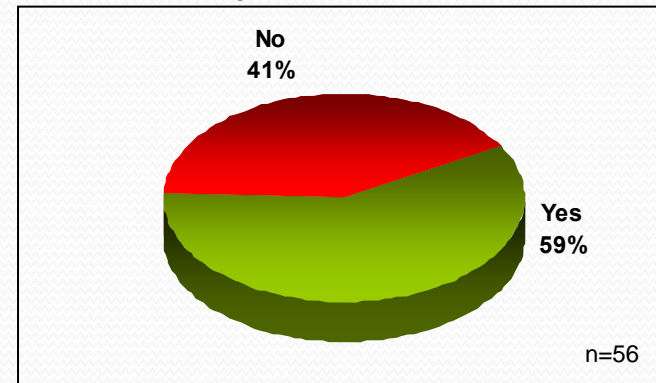
Current TV set replaced by...



Unplug chargers not in use



Use multiple sockets with switch

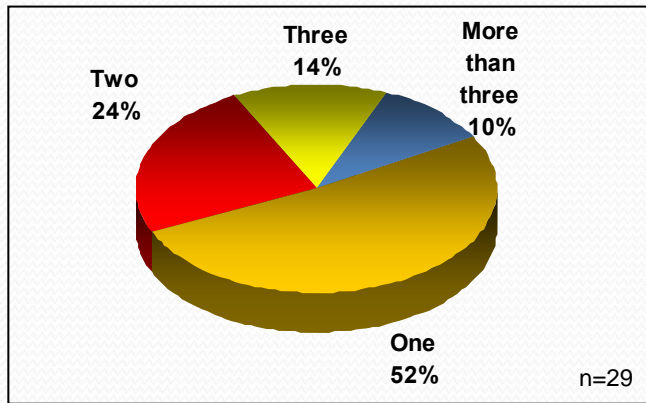


What would you choose to replace your existing TV?
Do you unplug the chargers when not using them? / use multiple sockets with a switch to disconnect all appliances from the mains?

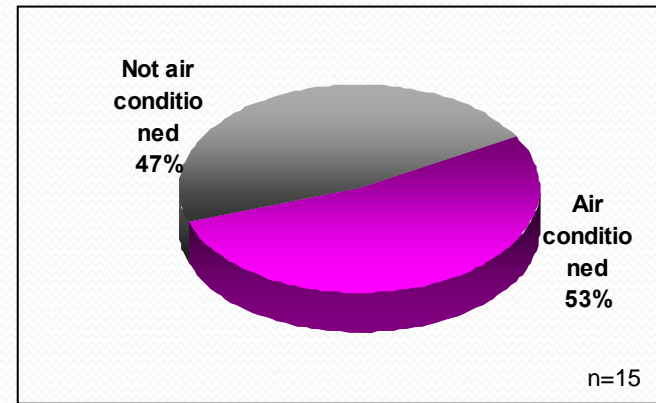
Half respondents own one air conditioning unit (mainly split type) which covers half of the household surface. 1 in 4 leave the doors open when the air conditioning is on.

Set temperature at winter: 24° C, set temperature at summer: 24° C

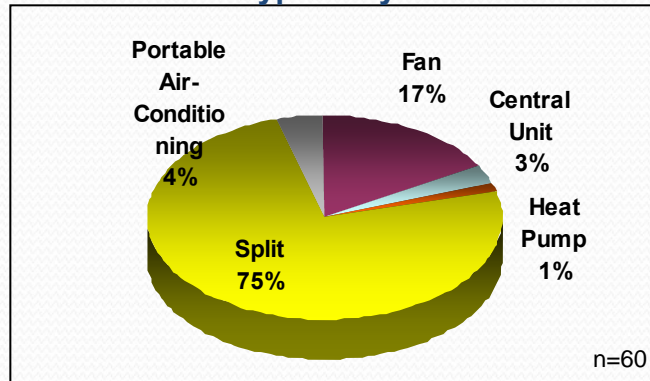
of units owned



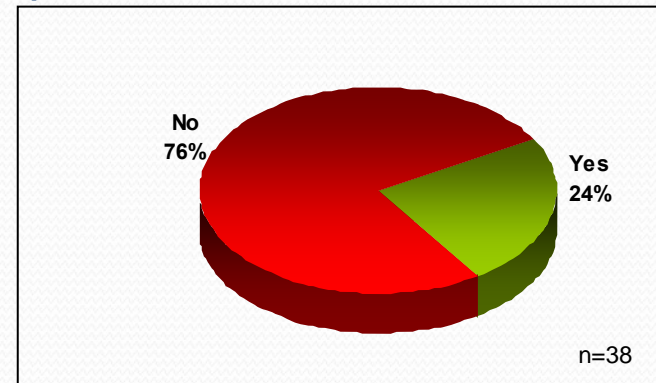
% of air conditioned household surface



Type of system

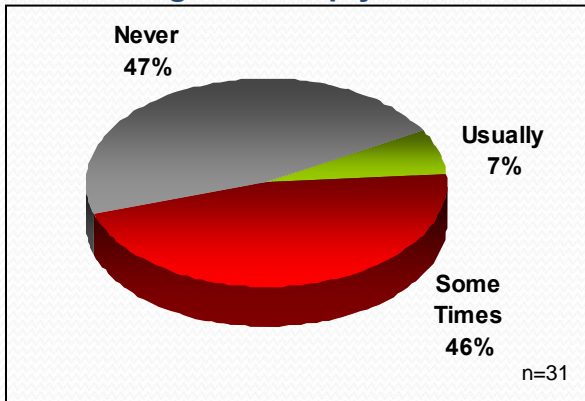


Leave open doors / windows while air conditioning is on

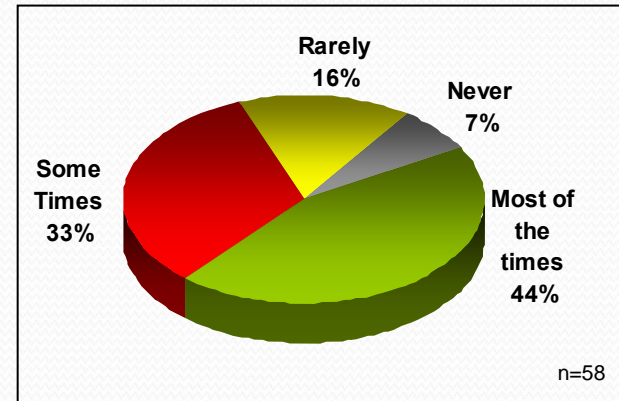


Half respondents tend to leave the lights on in empty rooms, however half usually replace the conventional bulbs with low-consumption ones. Those who do not replace them, claim that either the light quality is poor, they are expensive, or they do not like their appearance. The majority of those who replace them have not changed their lighting habits since.

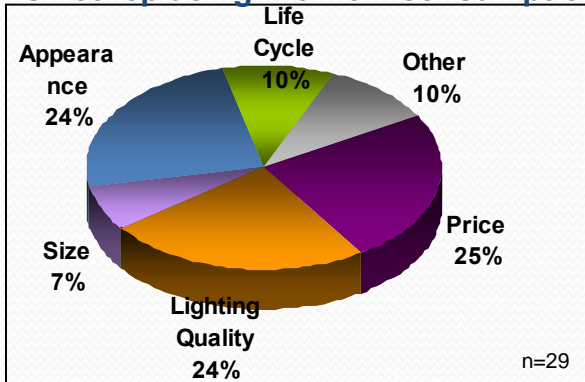
Lights in empty room



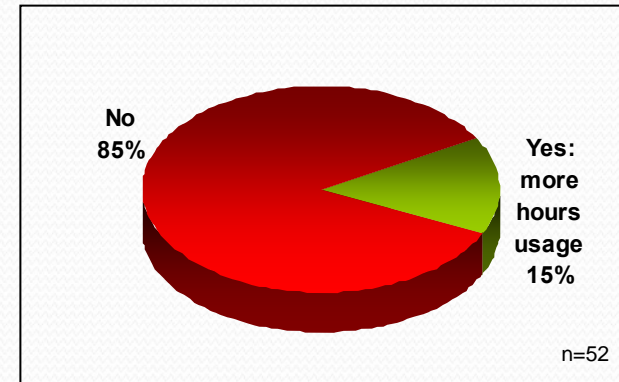
Replace bulbs with low-consumption ones



Reasons not replacing with low-consumption bulbs

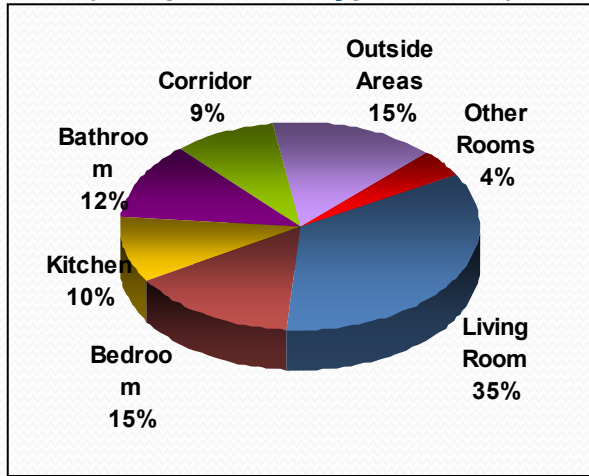


Change in lighting behavior since replacement

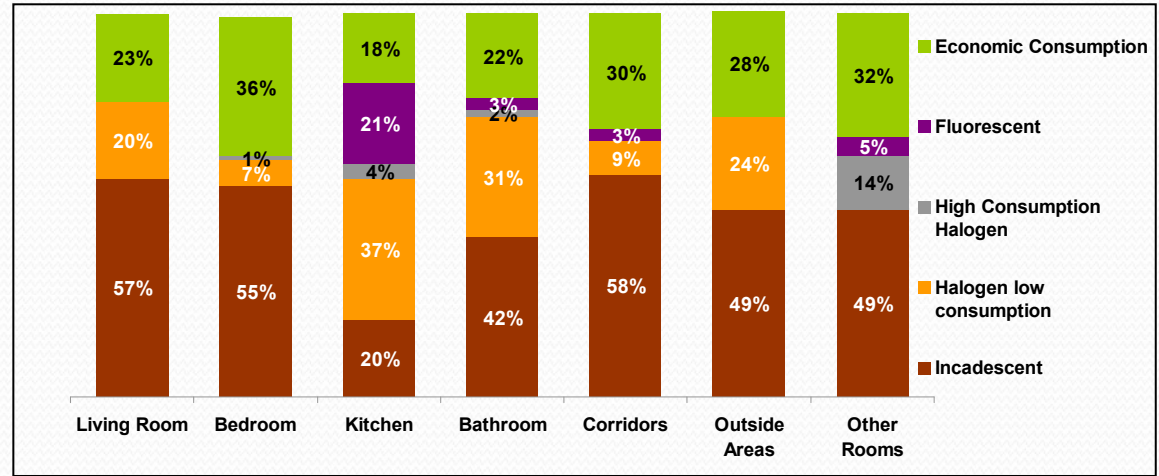


The living room is the one with the most light bulbs. Almost 1 in 2 are using incandescent bulbs across the household, albeit to a lesser extent in the kitchen, where low consumption halogen are dominant.

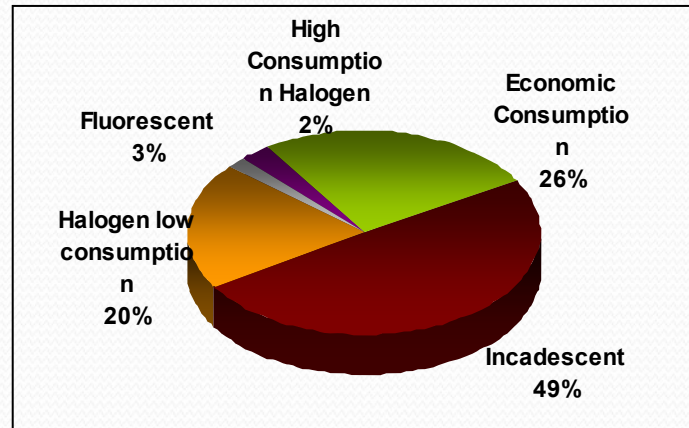
Light bulbs per room (irrespective of type of bulb)



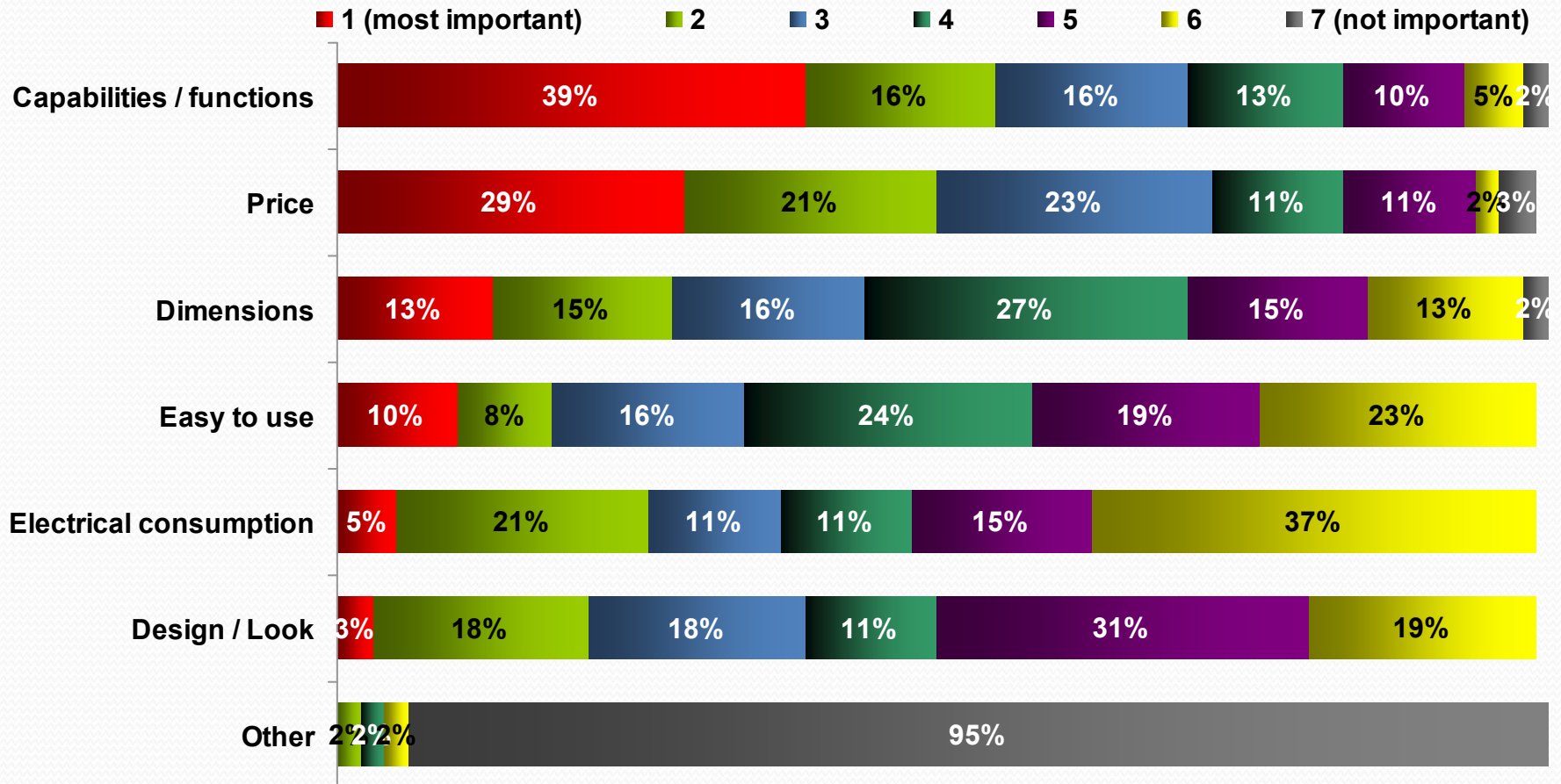
Light bulb types per room



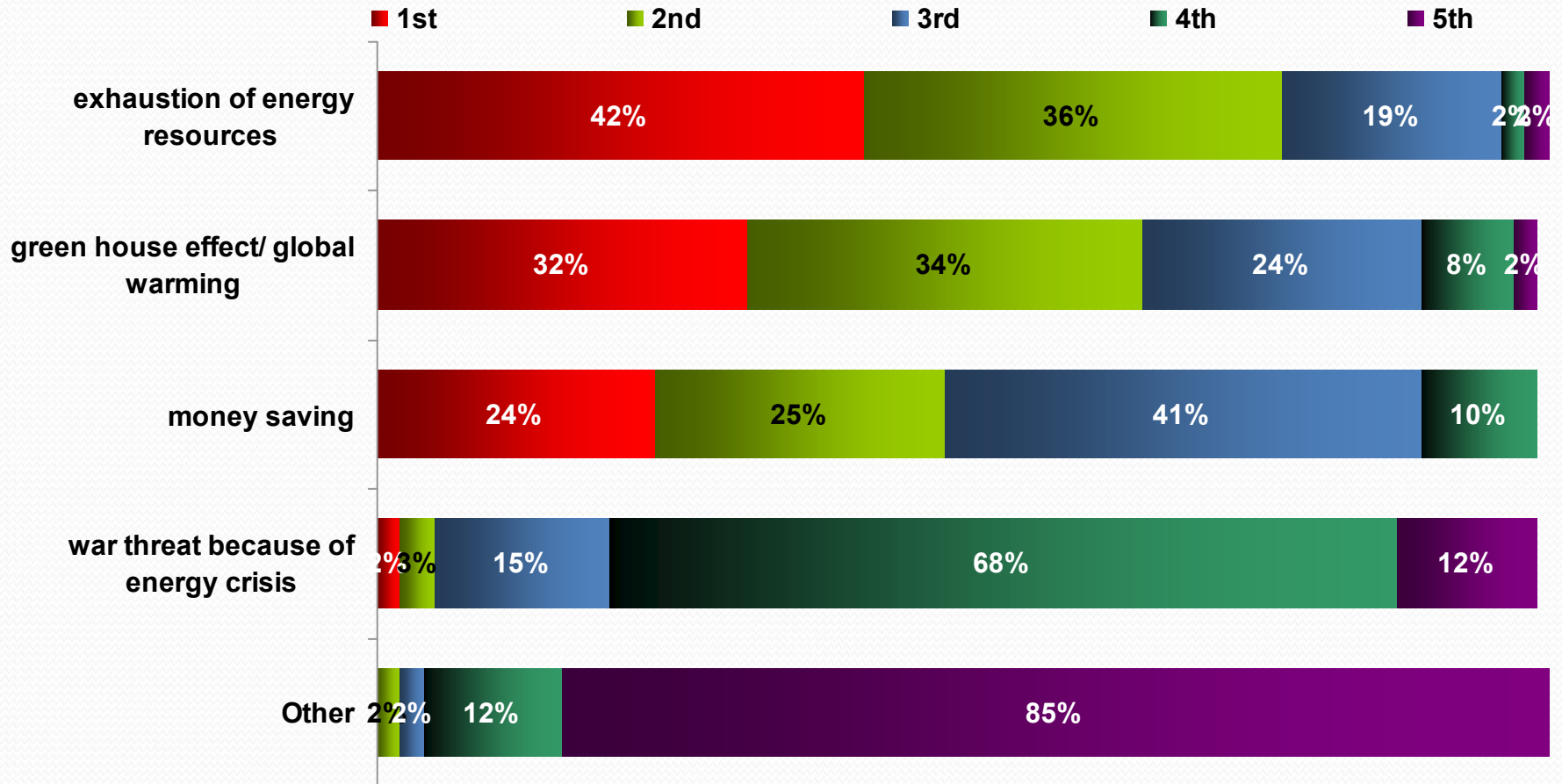
Light bulb types (irrespective of room)



Commodity characteristics are ranked as the most important ones when purchasing an electric appliance. Electrical consumption is ranked 1st only by 5% of the respondents.

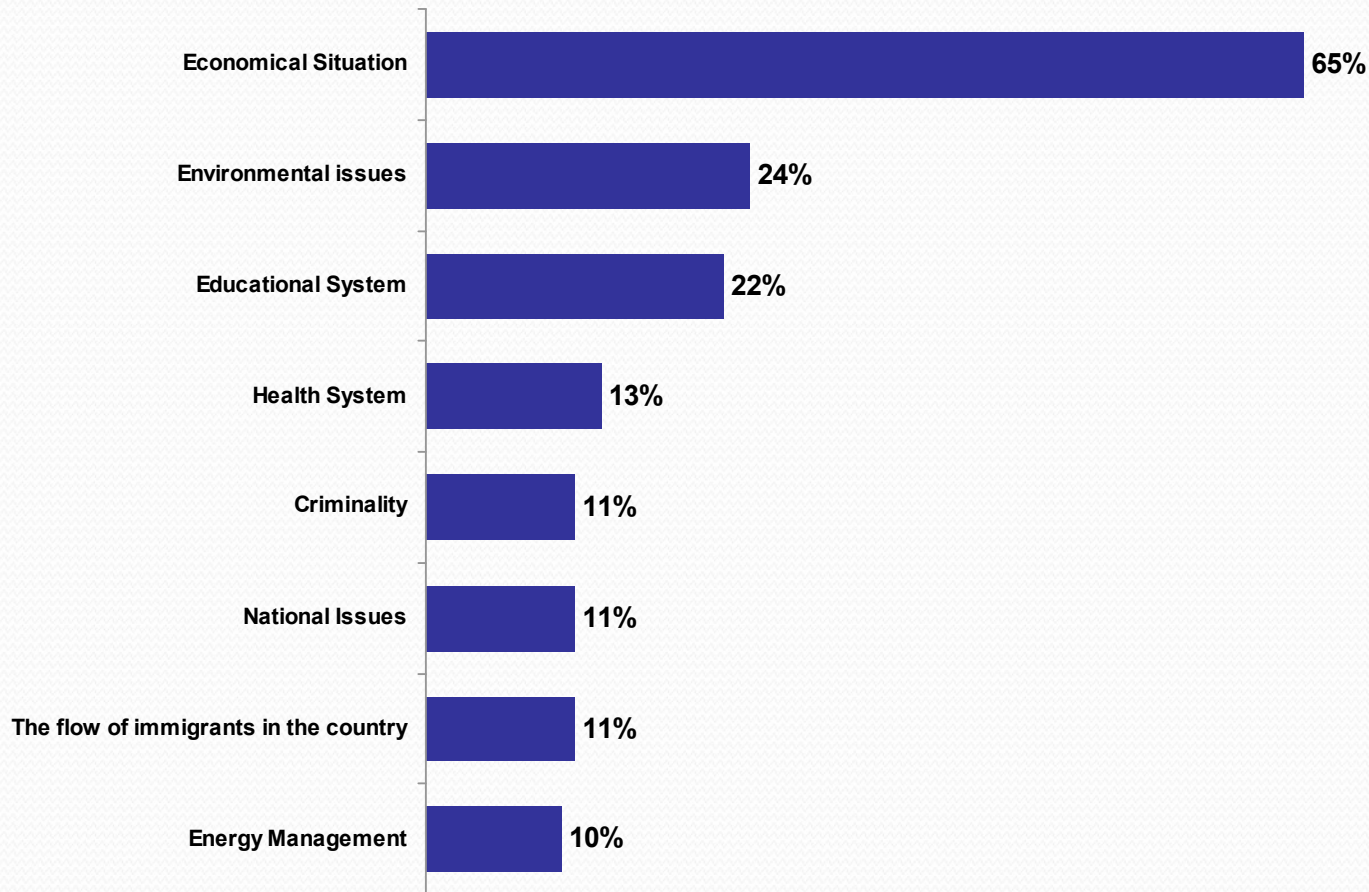


4 in 10 believe that the major reason it is important to save energy is not to deplete the energy resources. The green house effect and economy follow.



Awareness and information about environmental issues and energy

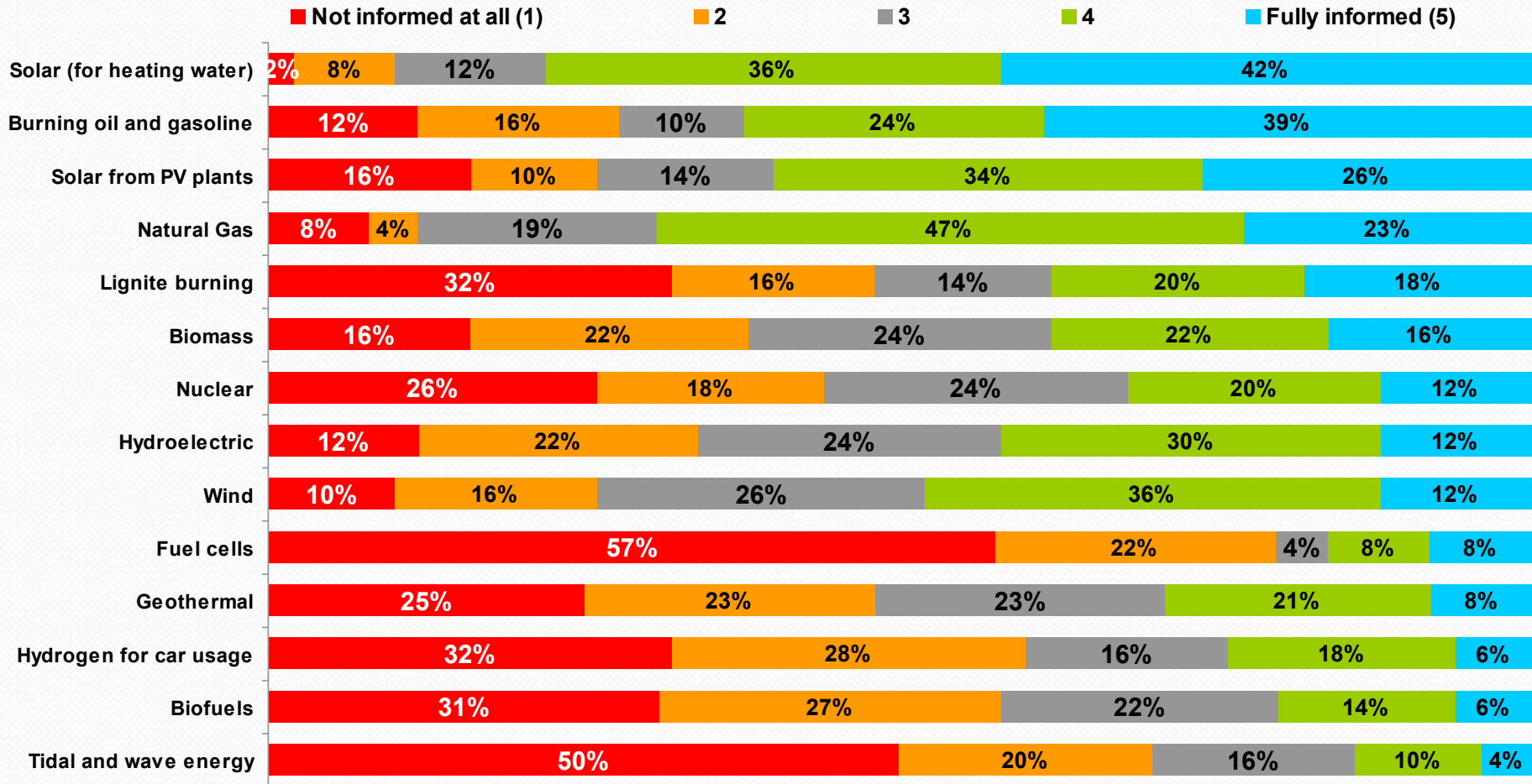
Participants believe that the Economy is the most fundamental issue fretting Greece today, followed at a distance by the Environment and the Educational system.



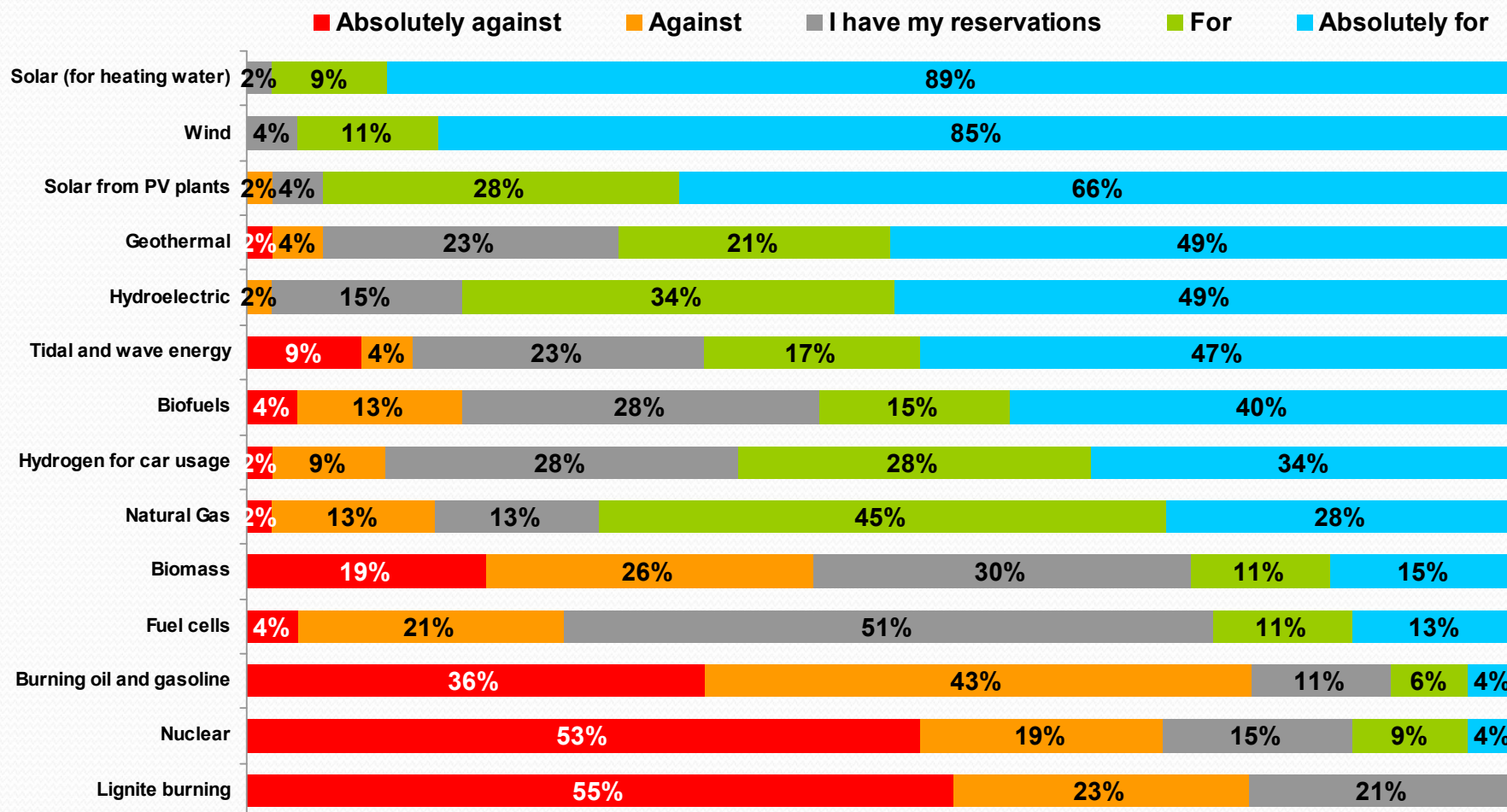
Degree of information on each energy type



Participants claim to be more informed on solar (heating water) energy and burning gas / gasoline, both being energy forms used in their every day life. To the contrary, more than half are not informed at all on fuel cells.



Solar energy for heating water together with wind power and energy from PV plants receive the most support for usage in Greece. On the other hand are nuclear power with energy from lignite and oil or gasoline. The skepticism towards the other lesser known RES is clearly evident.



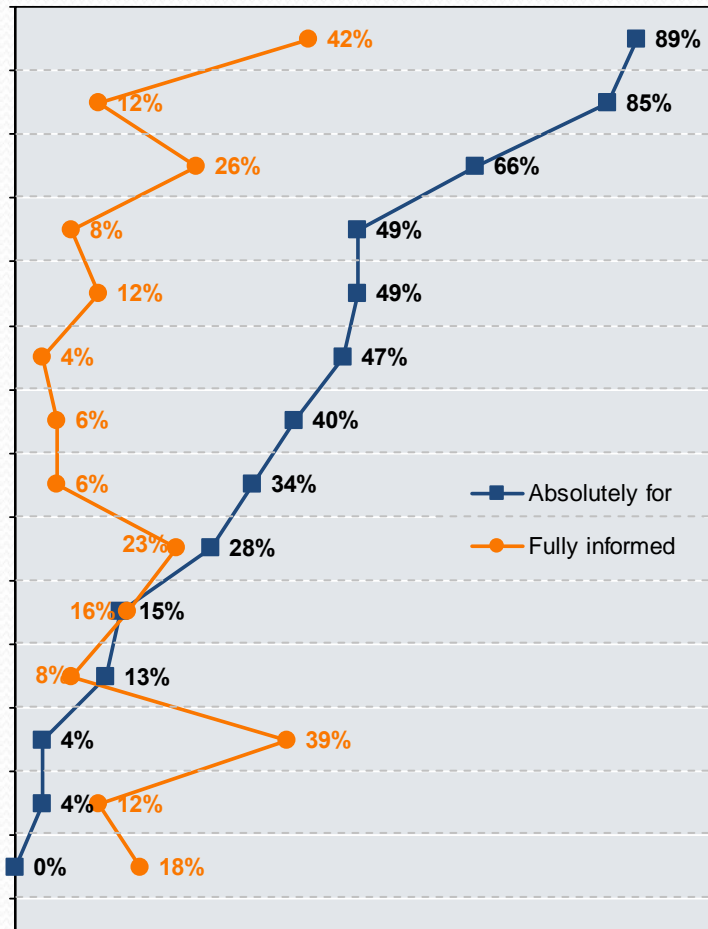
Degree of information on each energy type vs. Attitudes towards their usage in Greece



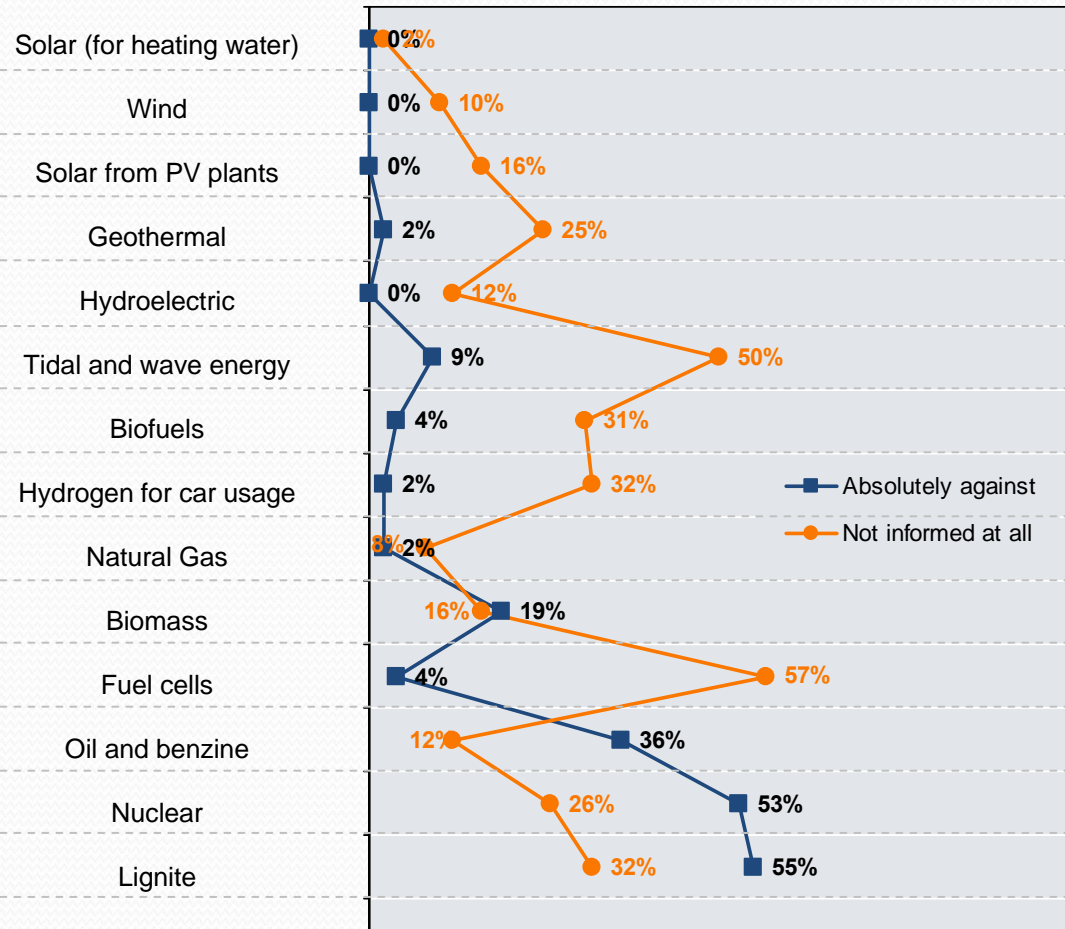
Top box and Bottom box

It seems that attitudes towards the use of various energy types are a function of either (a) the degree of information for each (i.e., the more they feel informed, the more positive they are towards their application in Greece) such as PV plants, (b) how familiar they are with them on a day-to-day basis such as solar for heating water and burning oil & gasoline, and (c) whether the type of energy is considered to be “mild”, such as wind and tidal energy.

Top Box



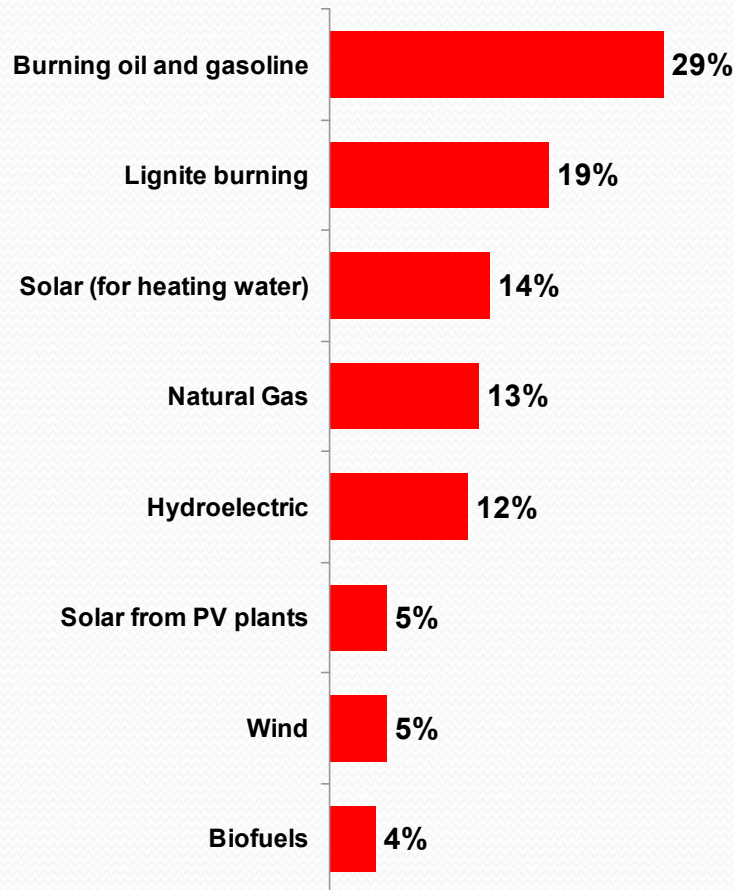
Bottom Box



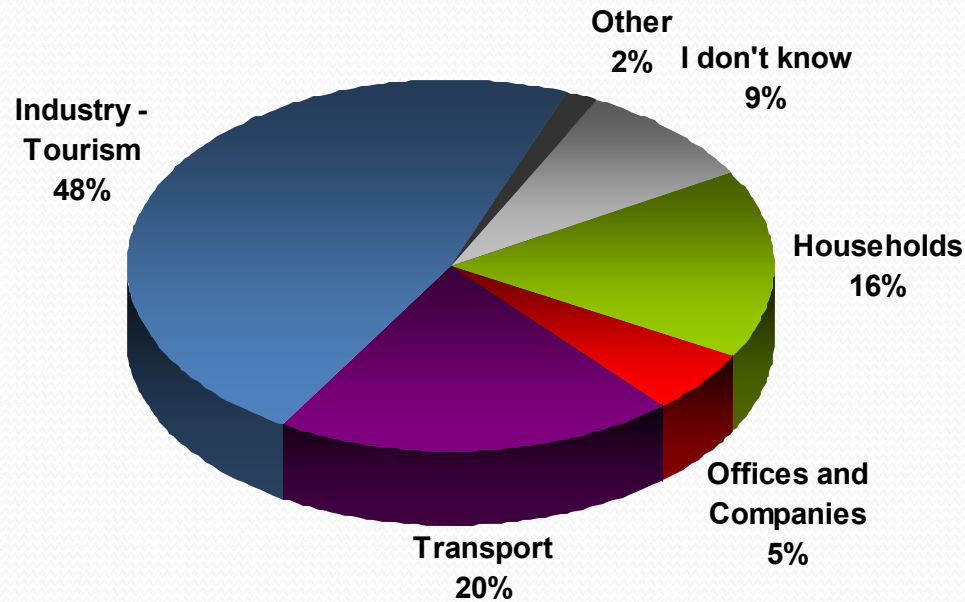
Energy types most used in Greece



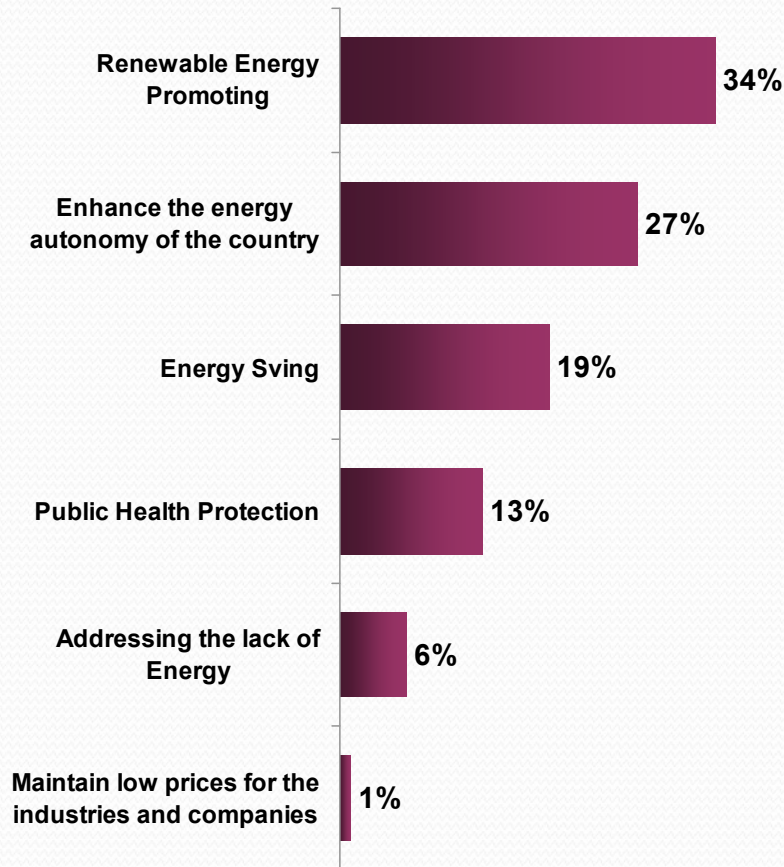
In consumers' perceptual framework, although without 3 prominent energy types that are mostly used in Greece, burning oil and gasoline comes first.



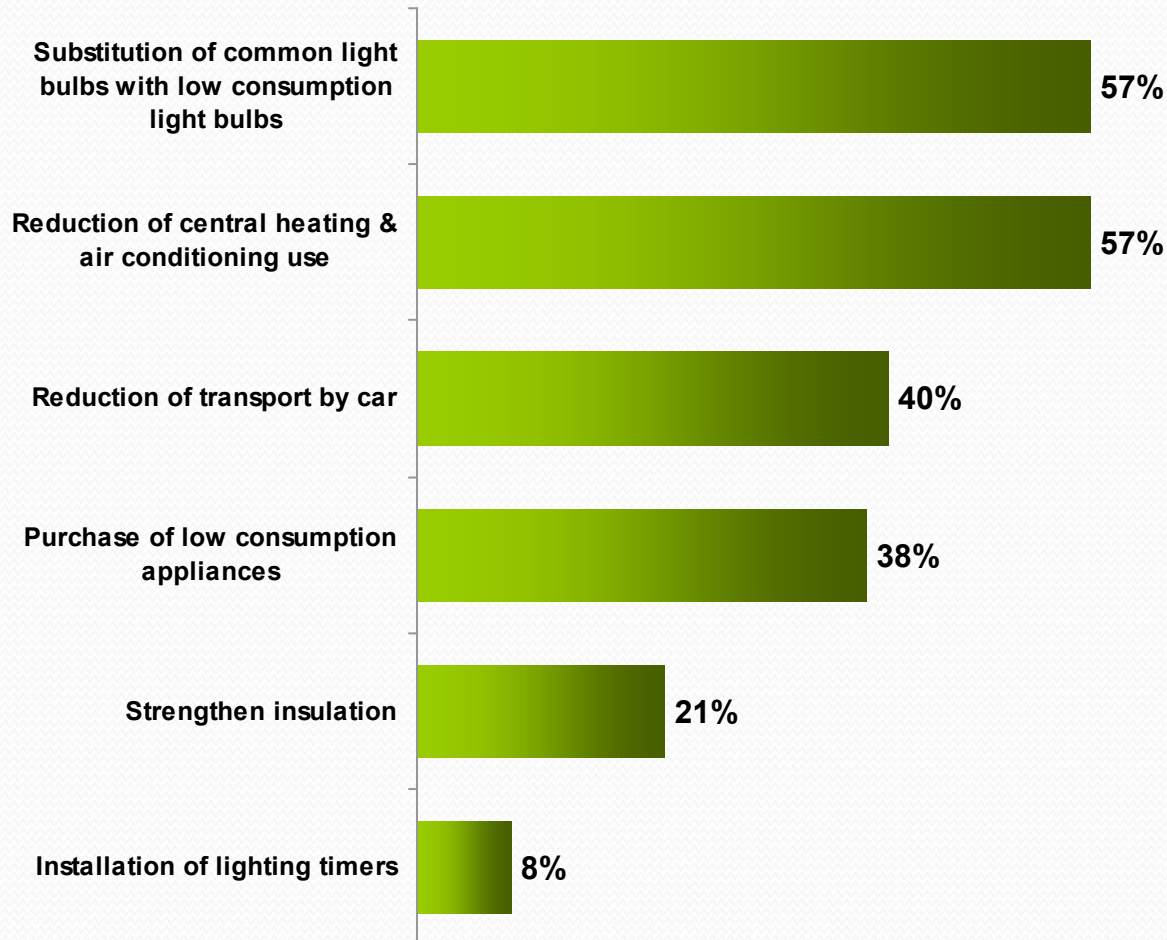
Half place Industry & Tourism as the largest energy consumer in Greece. Only 16% believe it is the households; this may hinder their efforts for change in energy consumption due to the low weight of the percentage → further education (actual percentage is 25%) can lead to more internalized locus of control and thus meeker energy consumption.



Promotion of RES is perceived as the top priority objective for the Greek energy policy, followed closely by development of energy autonomy of the country.



6 in 10 claim to have substituted common light bulbs with low consumption ones and also to have reduced central heating and air conditioning usage.

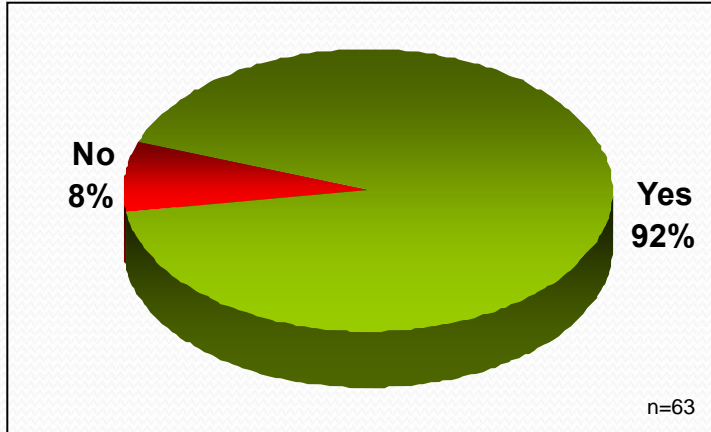


Membership in environmental organization and information on environmental and energy issues

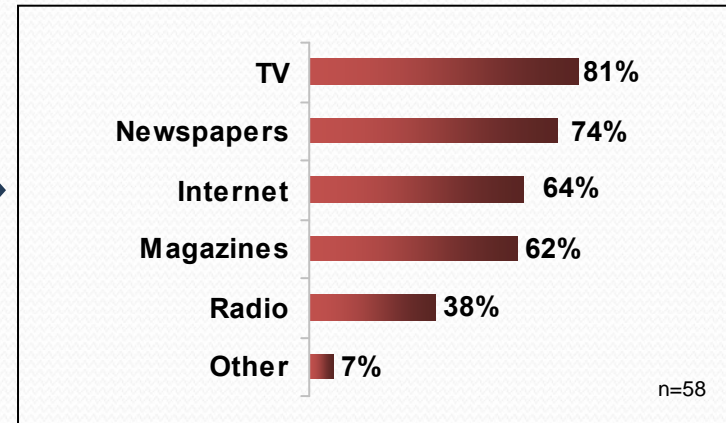


The vast majority is not a member of any environmental organization, however most claim to get informed on environmental issues, mainly through TV and newspapers.

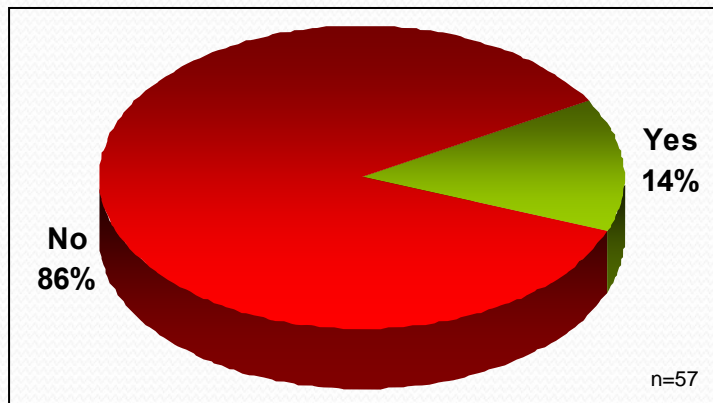
Information on environmental issues



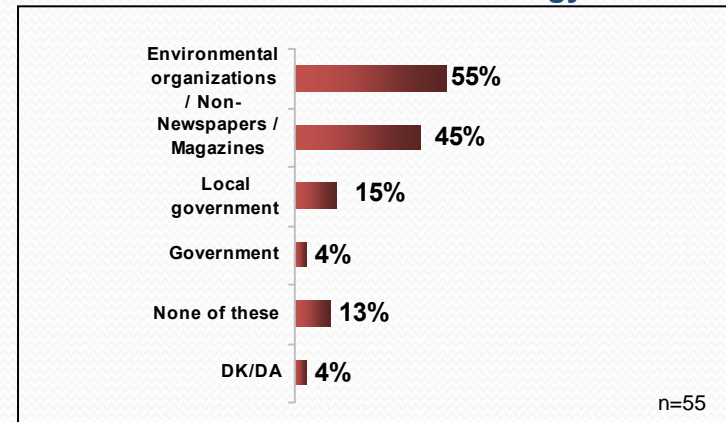
Information sources



Members of environmental organization



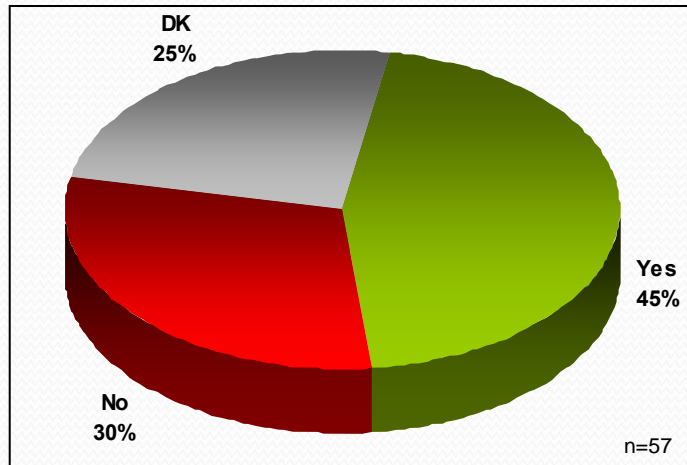
Most trusted info source for energy issues



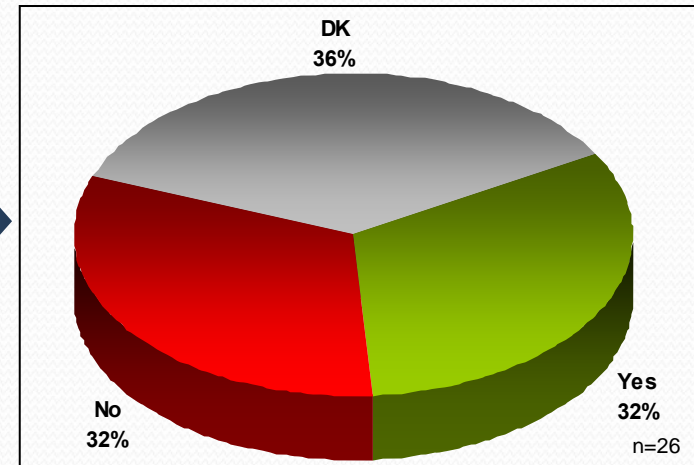
Do you get informed on environmental issues from magazines, newspapers, etc? / If yes, which sources of info?
Which of the following do you trust more for information on energy issues? / Are you a member of an environmental organization?

45% are willing to pay more for RES descendant electricity, among which, 1/3 believe that they can influence others to join them in being willing to pay. 4 in 10 regard themselves as early adopters (actual percentage in general population is 14%).

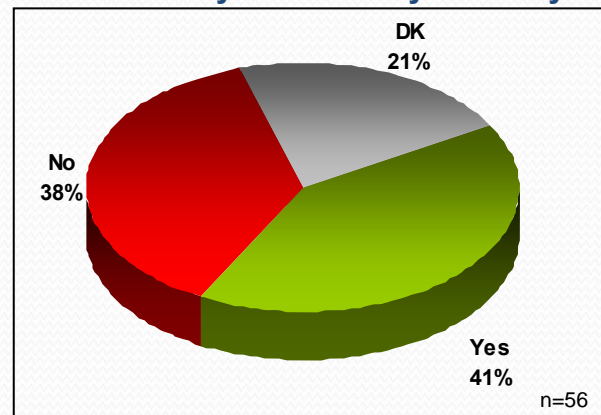
Pay more for electricity because it comes from RES



Can they influence others on this?



Degree to which they believe they are early adopters



Summary

- The **general conclusion** is that most citizens are **not adequately informed on environmental and energy saving issues**, which is evident either in their energy consumption **habits** or their **beliefs and attitudes**. Regarding their energy consumption habits...
 - **1 in 2** never cleans the refrigerator grid
 - **1 in 4** does not check the energy label of the fridge / refrigerator and 3 in 10 for the dishwashers
 - **6 in 10** do not fully load the washing machine
 - **6 in 10** do not always place the lid while cooking
 - Energy classes A++ and A+ are found only at 1 in 10 refrigerators, while quite a few are not aware of the exact energy class of the appliances
 - **3 - 4 in 10** do not use the energy saving function on their monitor / PC
 - The majority is not aware of the “energy star” label meaning in PCs and monitors
 - Half are not aware that the screen savers actually saves energy
 - **1 in 4** does not know that some appliances use up electricity even if they are turned off but not unplugged
 - **6 in 10** do not unplug the chargers (mobile, laptop) when not in use
 - **1 in 4** leave open doors when air conditioning is on
 - **1 in 2** leaves lights turned on in empty rooms

- Regarding their attitudes, although 92% claim to be informed on environmental issues...
 - Only 5% rank “electrical consumption” as the 1st most important selection criterion when purchasing an electric appliance.
 - Almost 7 in 10 believe that the Economy is the major issue tantalizing Greece (as opposed to 24% that believe it is the Environment)
 - They report ignorance concerning most RES
 - Attitudes towards the use of various energy types are a function of either (a) the degree of information for each (i.e., the more they feel informed, the more positive they are towards their application in Greece) such as PV plants, (b) how familiar they are with them on a day-to-day basis such as solar for heating water and burning oil & gasoline, and (c) whether the type of energy is considered to be “mild”, such as wind and tidal energy.
 - Only 16% believe the households are the main energy consumers; this may hinder their efforts for change in energy consumption due to the low weight of the percentage. Further education is needed (actual percentage is 25%) to lead to more internalized locus of control and thus meeker and more responsible energy consumption.