



EDP Gamification

Quantitative Study - Initiative 4

Lisbon, September 2015

Disclaimer

This quantitative study is based on an interactive online client platform and it was conducted by TNS for EDP Distribuição (shortly designed as EDPD) as a partner on the work package 5 of S3C, an European Union project, funded under the FP7 program. The purpose of this study is to assess the impact of the Gamification initiative on the end users (electricity consumers). The gamification initiative was developed in the project by EDPD and there it was possible to test the tools and guidelines developed within the course of S3C. This initiative took place in the Inovgrid test site of Alcochete.

In the meter Home Energy Management initiative, EDP tested the following guidelines (which were developed in deliverable 4.1 of S3C project):

- Gamification - making energy funny;
- How personal goals can motivate behavioural change;
- Motivating consumers with social comparison and competition;

About the S3C project

S3C - Smart Consumer, Smart Customer, Smart Citizen - paves the way for successful long-term end user engagement by acknowledging that one typical smart consumer does not exist and uniform solutions are not applicable when human nature is involved. Beyond acting as a passive consumer of energy, users can take on different positions with respective responsibilities and opportunities. In order to promote cooperation between users and the energy utility of the future, S3C addresses the end user on three roles:

- The Smart Consumer is mostly interested in lowering his/her energy bill, having stable or predictable energy bills over time and keeping comfort levels of energy services on an equal level;
- The Smart Customer takes up a more active role in future smart grid functioning, e.g. by becoming a producer of energy or a provider of energy services.
- The Smart Citizen values the development of smart grids as an opportunity to realize 'we-centred' needs or motivations, e.g. affiliation, self-acceptance or community.

The S3C project (2012-2015) has received funding from the European Union's Seventh Framework Program for research, technological development and demonstration under Grant Agreement No. 308765. For more information on the S3C project, please visit the [project website](#).



Contents

1. Executive Summary
2. Introduction – Quizzes results
3. Main Questionnaire Results
4. Appendix





1. Executive Summary

Executive summary

- This report is part of the S3C project and it aims to develop a best practices toolkit to improve the commitment with the energy topics.
- This report is part of 4 initiatives and it provides a quantitative view of the project implemented in Alcochete. Furthermore, it also addresses the following aspects:
 - It follows the Quiz implemented by EDPD aiming to improve the engagement with the energy subject, in general, and also with benefits of the smart grids in a learning and competitive environment;
 - It measures three main topics: engagement, awareness and habits towards energy consumption/production.
- All the 104 gamers answered previously to 3 quizzes and this study was made with a significant sample.
- 86% of respondents answered correctly to all questions raised. However, they showed more awareness on the first one: almost 90% answered correctly to the questions on Quiz 1; 83% answered correctly on Quiz 2 and 85% on Quiz 3.
- In general, topics related to energy consumption and production have a high level of interest and importance among respondents (88% and 82%, respectively).
- Regarding the different functionalities, the respondents evaluate them in a very positive way, being “know the best tariff and power to your home” and “check the total energy used in your home at any time” the most valued ones.
- Concerning energy efficiency, smart grid awareness and benefits, most of the attributes were answered correctly (75%). Even though there was a very high score in all sets of questions, the respondents showed more knowledge on Energy Efficiency related attributes (on average, they answered correctly to 4 out of 5 attributes).



Executive summary

- The issues related to waste of energy as well as ways to avoid it are the most important attitudes and behaviours for the respondents (e.g. turn off the lights or pay attention to energy efficiency labels). On the opposite, actions that involve checking/communicate energy consumption, use LED bulbs or use equipment on economic hours are less present among respondents.
- Energy efficiency is a topic that respondents talk occasionally: 53% affirm talking occasionally about it with their friends and relatives.
- The InovGrid project is not a topic discussed very frequently, but when respondents talk about the project it is in a positive way (35% talk about it positively).
- More than 80% would recommend smart meter installation to take place not only in Alcochete but at a national level.
- From the above results, we can observe that energy efficiency seems to be a relevant subject among the participants as people show interest to know more about the possibility to avoid waste of energy (e.g., be aware about the best tariff to their own consumption). Nevertheless, changing some habits to accomplish it (e.g., change to LED bulbs) seems to be not that easy.



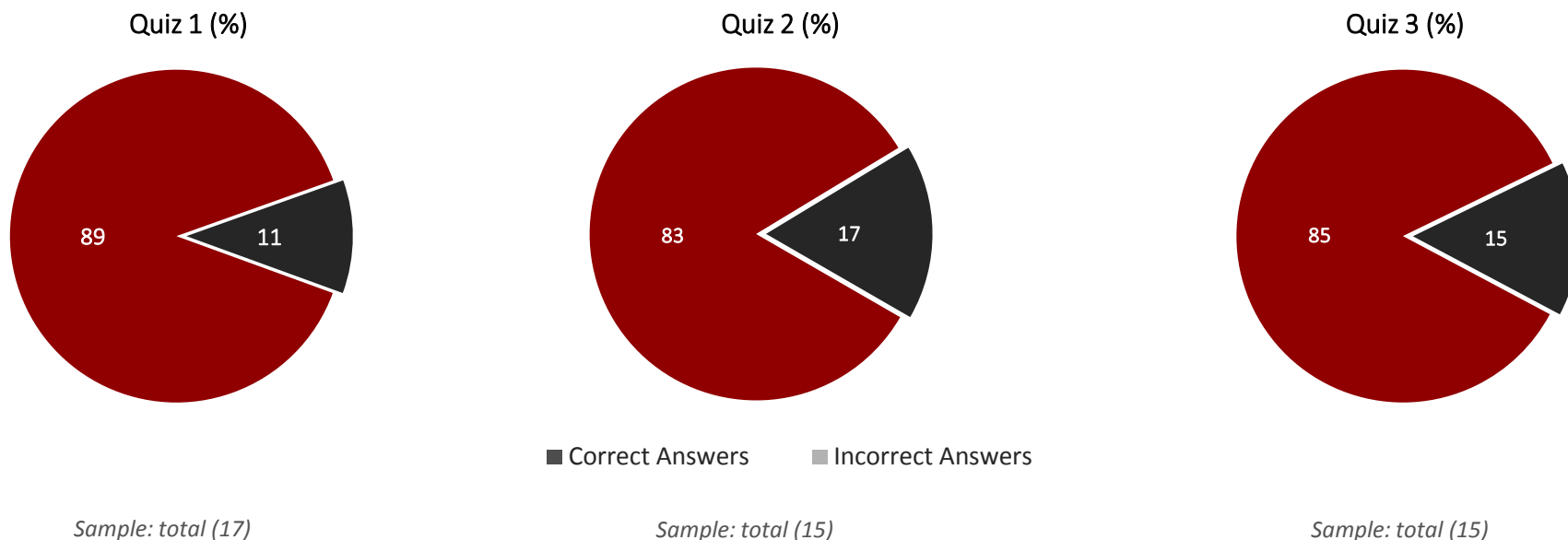


1. Introduction – Quiz Results

Quiz results

Correct and Incorrect Answers by Quiz

Before answering the questionnaire, respondents completed 3 quizzes. They showed more knowledge on the 1st one than on the 2nd and 3rd, showing the following distribution of correct and incorrect questions:



Average of correct and incorrect answers for each quiz:

Correct	8,9
Incorrect	1,1

Correct	8,3
Incorrect	1,7

Correct	8,5
Incorrect	1,5

Q11. to Q16. Correct and incorrect answers – Quiz 1, Quiz 2 and Quiz 3

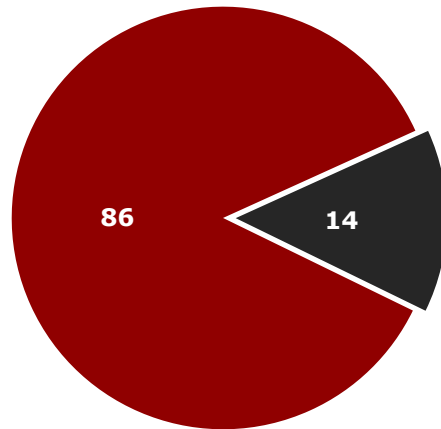


Quiz results

Total of Correct and Incorrect Answers and Quiz Score

- 86% of respondents answered correctly to all questions;
- The majority had a score higher than 26.000 points.

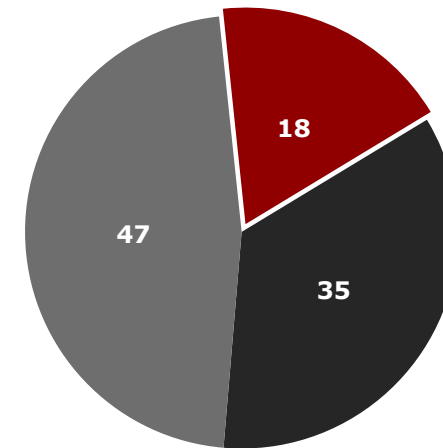
Total questions (%)



■ Correct Answers

■ Incorrect Answers

Quiz Score (%)



■ 8.000-20.000

■ 21.000-25.000

■ >26.000

Average of correct/incorrect answers - 3 quizzes:

Correct	8,6
Incorrect	1,4

Q11. to Q16. Correct and incorrect answers – Quiz 1, Quiz 2 and Quiz 3

Q17a. Total of points





3. Main Questionnaire Results

Main Results

Engagement with Energy Production/Consumption

Energy efficiency and smart grid awareness and benefits

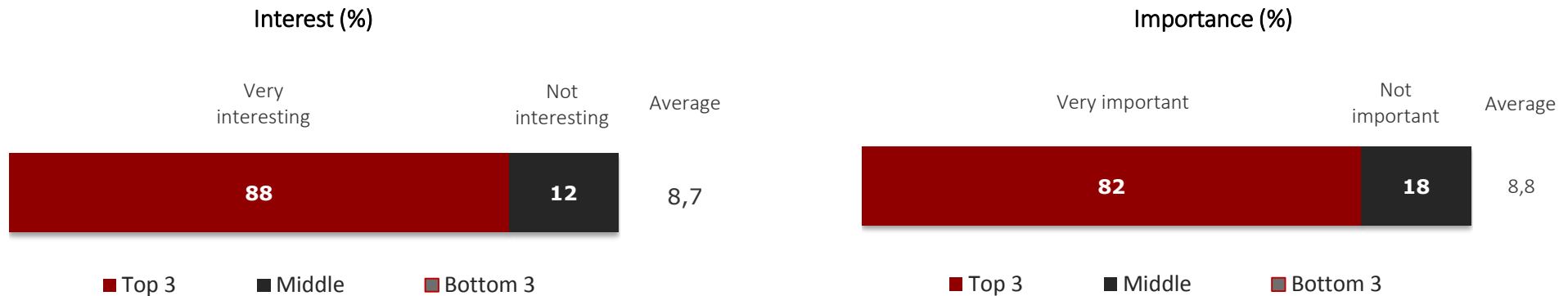
Energy consumption habits and word-of-mouth



Engagement with Energy Production/Consumption

Interest and Importance

The majority of the respondents considers important and relevant the subjects related to energy consumption/production. Also noteworthy is the fact that none of the respondents revealed to have low level of interest or importance in this topic.



Q18. Please tell me to what extent do you have interest in subjects related with energy consumption/production?

Q19. In overall, to what extent do you consider that subjects related to energy consumption/production are important to the community in general?

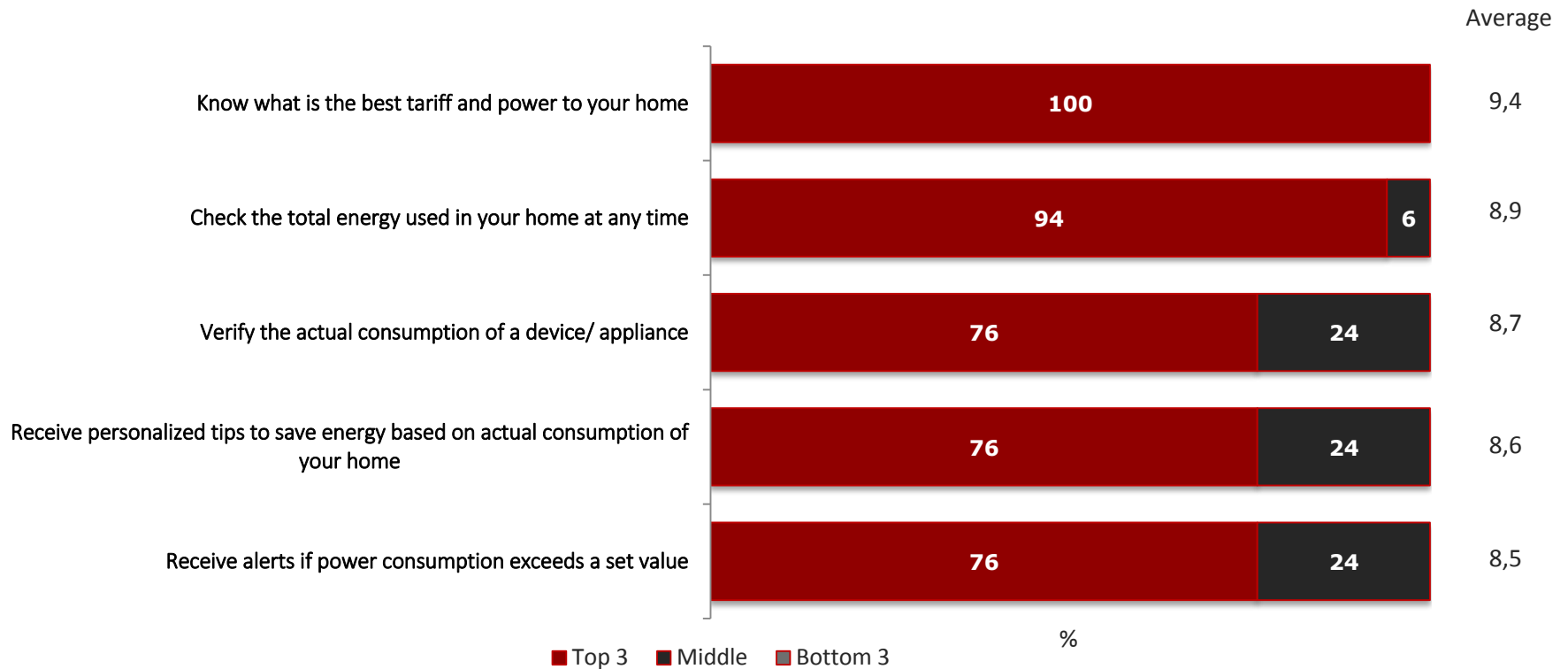
(scale 1 to 10: 1 – Not at all interest/ important; 10 – Very interest/ important)



Engagement with Energy Production/Consumption

Attributes Importance

When asked about the importance of certain functionalities, respondents assigned a high degree of importance to all of them. Nevertheless, the possibility to know more about the best tariff and to check the total energy used are the functionalities best evaluated by the respondents.



Q20. To what extent do you consider important each of the following situations?
(scale 1 to 10: 1 – Not at all important; 10 – Very important)

Sample: total (17)



Main Results

Engagement with energy production/consumption

Energy Efficiency and Smart Grid Awareness and Benefits

Energy consumption habits and word-of-mouth

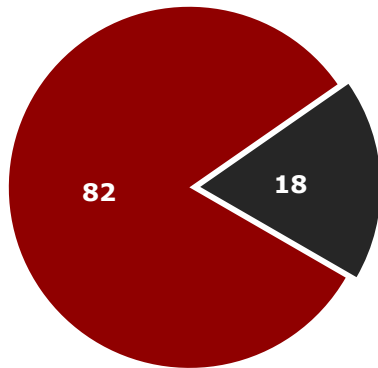


Energy Efficiency and Smart Grid Awareness and Benefits

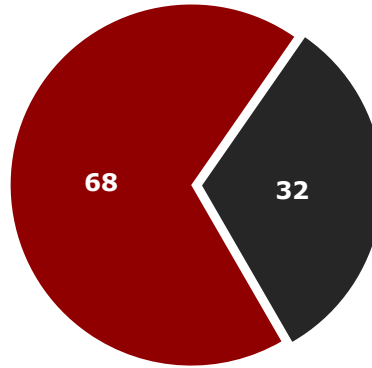
Correct and Incorrect Answers by Topic

Respondents are more aware about issues related to energy efficiency, having answered correctly, on average, to 4 out of 5 statements. Regarding smart grids, respondents revealed to have more knowledge about its benefits than the grid itself.

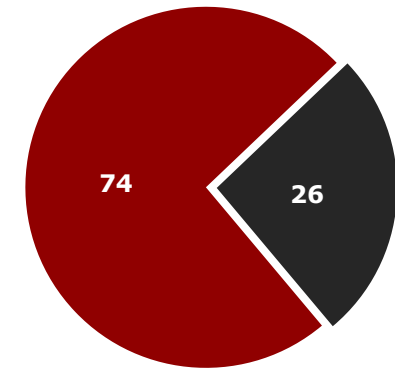
Energetic Efficiency Awareness (%)



Smart Grid Awareness (%)



Smart Grid Benefits (%)



■ Correct Answers ■ Incorrect Answers

Average of correct and incorrect answers for each group of 5 question:

Correct	4,1
Incorrect	0,9

Correct	3,4
Incorrect	1,6

Correct	3,7
Incorrect	1,3

Q21. Taking into account everything you know about Energy Efficiency, let us know if the following statements are true or false.

Q22. Taking into account everything you know about Smart Grids, let us know if the following statements are true or false.

Q23. Taking into account everything you know about Smart Grids benefits, let us know if the following statements are true or false.



Energy Efficiency and Smart Grid Awareness and Benefits

Energy Efficiency Awareness – Detailed Answers

(%)	TRUE	FALSE
Energy efficiency optimizes equipment operating conditions, avoiding energy waste	100	0
Energy efficiency seeks to optimize energy consumption	94	6
Put halogen bulbs in street lighting is energy efficiency measure	59	41
The control of global gas emissions with greenhouse effect is not essential for reducing energy needs	12	88
Energy efficiency reduces power consumption, reducing the power of the electric appliance/equipment	12	88

Q21. Taking into account everything you know about Energy Efficiency, let us know if the following statements are true or false.



Energy Efficiency and Smart Grid Awareness and Benefits

Smart Grid Awareness – Detailed Answers

(%)	TRUE	FALSE
The smart meter communicates the readings automatically to the electricity distributor	94	6
The smart meter is a device capable of calculating accurate estimations of the energy consumption of home	94	6
Smart Grids are grids that enable bidirectional communication between the distributor and the place of consumption	88	12
It is a new electrical power distribution architecture, more secure and reliable	82	18
Smart grids communicate only by low voltage electricity grids (within municipalities)	29	71

Q22. Taking into account everything you know about Smart Grids, let us know if the following statements are true or false.



Energy Efficiency and Smart Grid Awareness and Benefits

Smart Grid Benefits – Detailed Answers

(%)	TRUE	FALSE
The customer is billed based on its actual consumption rather than on an estimation	88	12
Be able to know what the best tariff and power to your home	88	12
To receive alerts if power consumption exceeds a certain value	76	24
Change the contracted power without calling a technician	76	24
Be able to check, by itself, the approximate consumption of a device/appliance	59	41

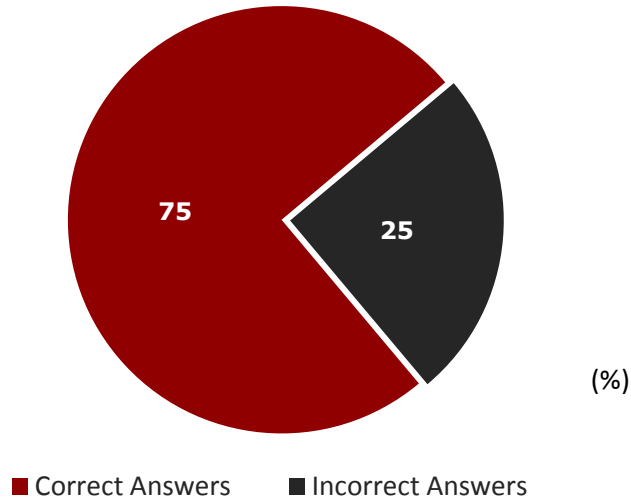
Q23. Taking into account everything you know about Smart Grids benefits, let us know if the following statements are true or false.



Energy Efficiency and Smart Grid Awareness and Benefits

Total of Correct and Incorrect Answers

- 75% of the answers given by respondents were correct – with an average of 11 correct answers out of 15.



Average of correct and incorrect answers for all 15 questions:

Correct	11,2
Incorrect	3,8

Q21. Taking into account everything you know about Energy Efficiency, let us know if the following statements are true or false.

Q22. Taking into account everything you know about Smart Grids, let us know if the following statements are true or false.

Q23. Taking into account everything you know about Smart Grids benefits, let us know if the following statements are true or false.



Main Results

Engagement with energy production/consumption

Energy Efficiency and Smart grid Awareness and Benefits

Energy Consumption Habits and Word-of-mouth



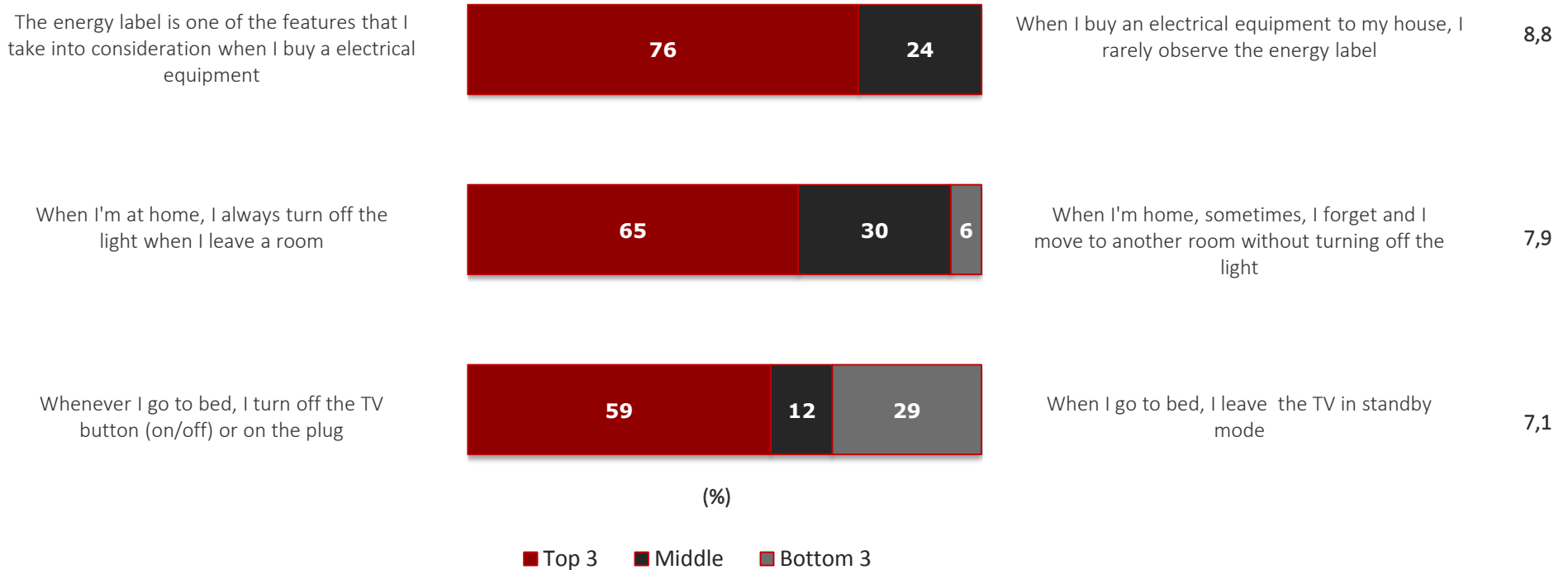
Energy Consumption Habits and Word-of-mouth

Energy Consumption Habits

In what concern practices on daily routines, respondents suggest that they are aware of energy waste and ways to avoid it, such as: standby mode, unnecessary lighting or energy efficiency labels.



Average



Q24. From the following sentences, which one best describes your habits related to energy consumption?
(scale 1 to 10: 1 – do not agree; 10 – totally agree)



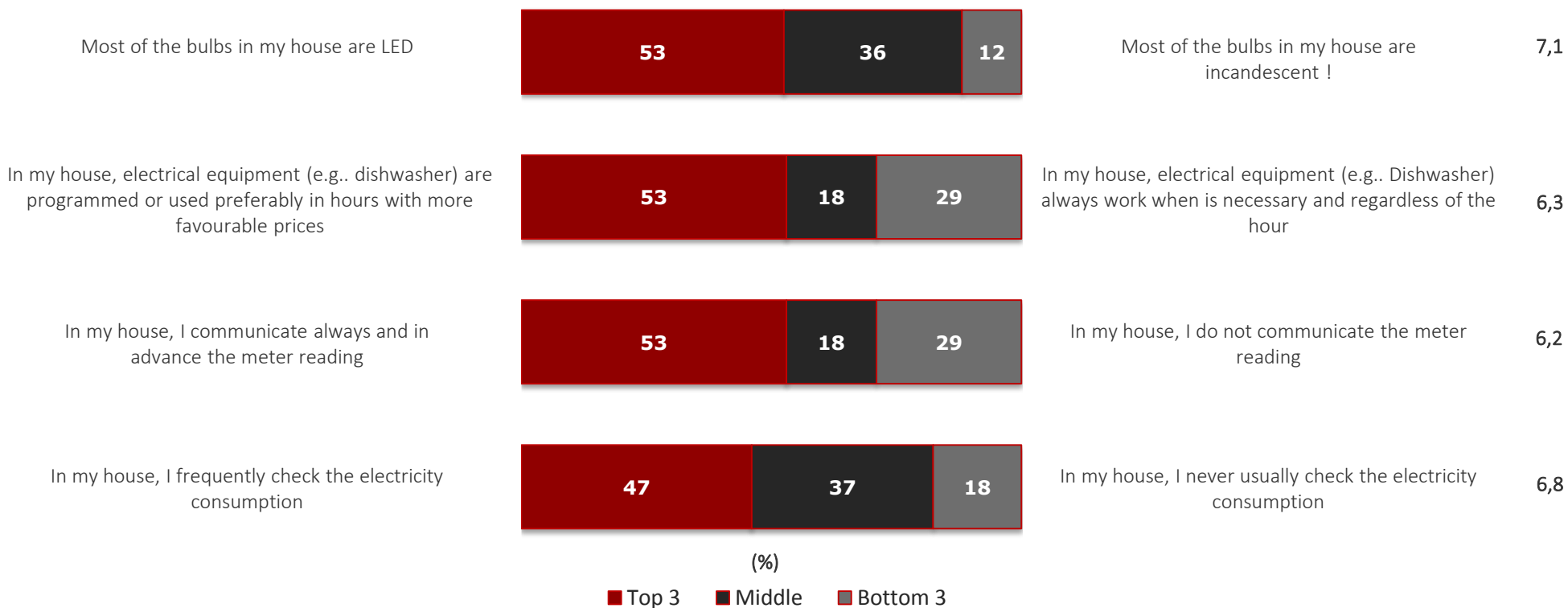
Energy Consumption Habits and Word-of-mouth

Energy Consumption Habits

On the other hand, they assume that is less likely to check or communicate the energy consumption. It is also necessary to improve measures to encourage them to use more LED Bulbs as well as the economic/biphasic schedule.



Average



Q24. From the following sentences, which one best describes your habits related to energy consumption?
 (On a scale 1 to 10: 1 – do not agree; 10 – totally agree)

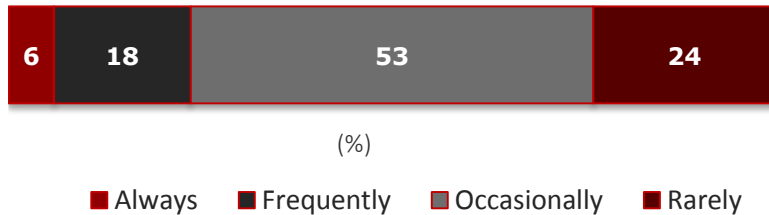


Energy Consumption Habits and Word-of-mouth

Word-of-mouth

- Most of the respondents talk occasionally about energy efficiency with their relatives or friends.
- Also the InovGrid project is not a very common topic in conversations, but when it is, it is mostly approached in a positive way.

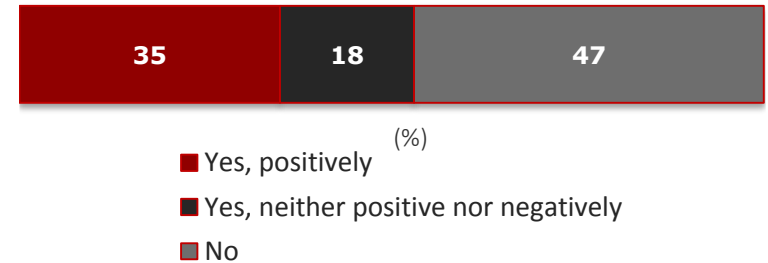
Energy Efficiency



Average

2,1

InovGrid Project



Q25. How often do you talk about energy efficiency with your family or friends? (scale 1 to 5)

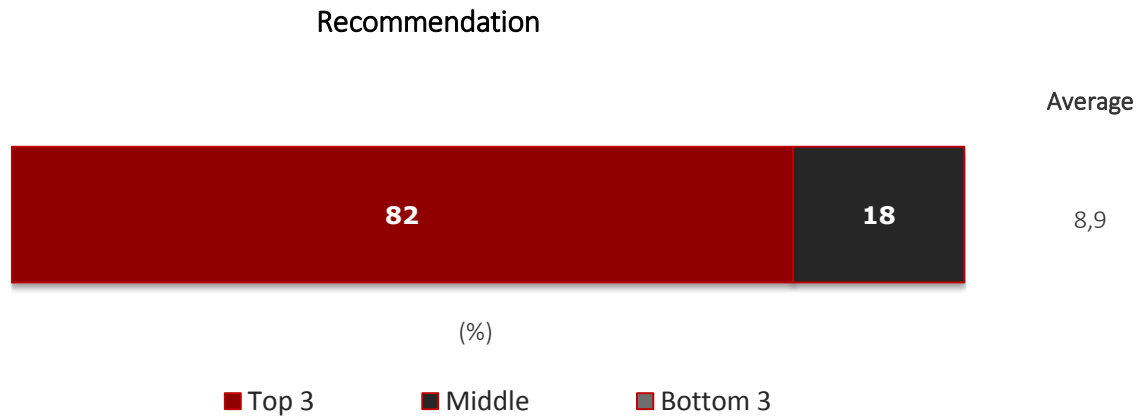
Q26. Have you already talked with your family or friends about InovGrid?



Energy Consumption Habits and Word-of-mouth

Recommendation

- 82% of the respondents would recommend to install the smart meters at a national level.



Q27. Would you recommend the smart meter installation at a national level?
(On a scale 1 to 10: 1 – would not recommend ; 10 – would recommend for sure)





4. Appendix

Methodology

Target



Target group

On this survey have participated 17 individuals, between the ages of 6 and 65 years old. All of the respondents lived in Alcochete and had previously answered to a quiz. They were contacted by e-mail (from the EDP database)

Interviews



Technical

Computer Assisted Web Interviewing (CAWI).

Sampling Period

July 28 to August 10 (2015)

Questionnaire

Developed by TNS with EDP consent. The questionnaire had a duration of 15 minutes (approximately), with no opened questions, regarding subjects as engagement, awareness and attitudes related to energy consumption/production, as well as the results of previous quiz and a socio-demographic characterization.

Data Processing



Data Analysis

The data was analysed through a statistical software. The data was subjected to logical consistency tests to ensure the quality of the presented results. There were analyses in terms of frequency and average of the numerical variables.



Sample

As sample is too small, here we present the absolute values

Socio-demographic characterisation

Gender		Age					Education		
Male	Female	6-11 Years	12-17 Years	18-34 Years	35-54 Years	55-65 Years	University (complete or not)	Secondary School (complete)	Elementary School (complete)
8	9	5	2	6	3	1	10	4	3

Socio-economic characterisation

Professional situation			Occupation						
Worker	Student	Unemployed	Business Owner	Senior Managem ent	White collar	Middle Managem ent	Administ rative	Manual Worker	Unempl oyed
8	7	2	2	3	5	1	3	1	2

House characterisation

House Type			Number of Rooms				Household Residents				
House	Apartment	Not Answer	3	4	5 or more	Not Answer	2	3	4	5	Not Answer
3	13	1	6	4	6	1	3	6	5	2	1

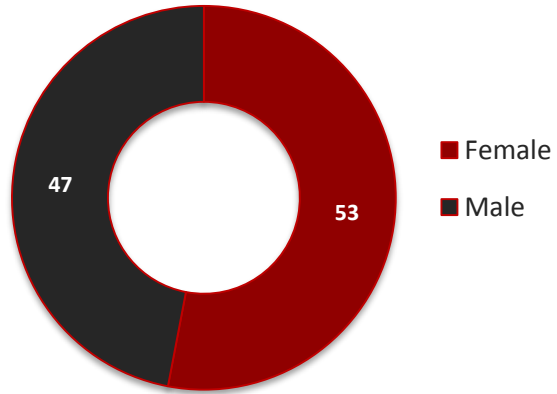
Appliances						
Pool	Electric Heating	Electric shutters	Boiler	Air conditioning	Broadband Internet	None of this
12	18	35	12	29	71	12



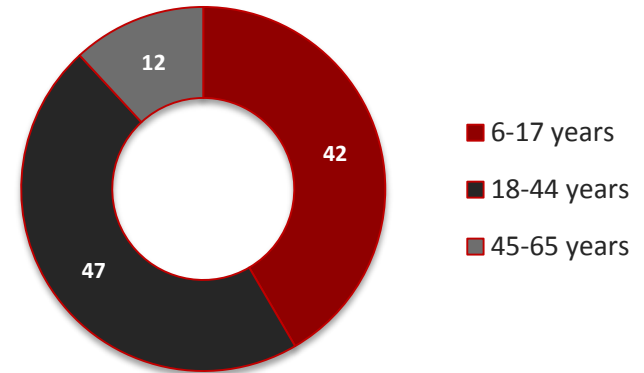
Sample: total (17)

Sample

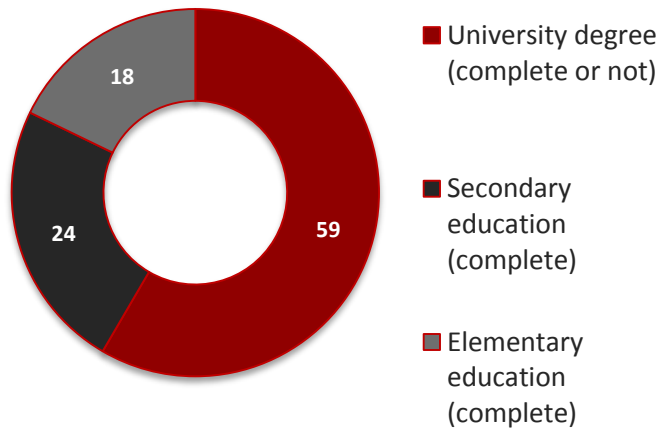
Gender



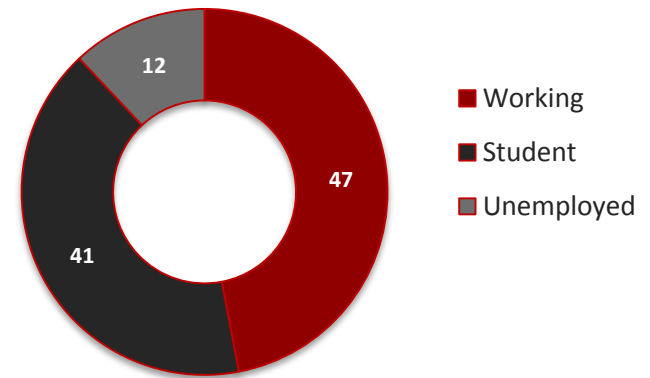
Age



Education



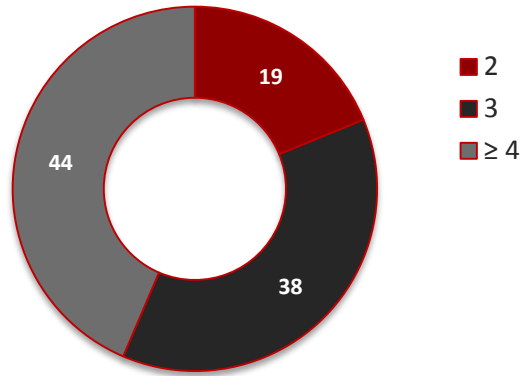
Current professional situation



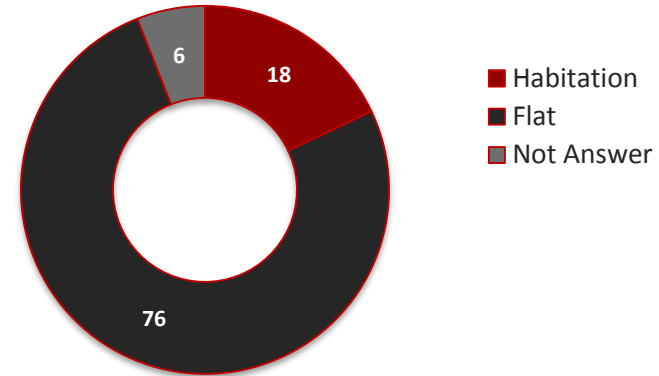
Sample: total (17)

Sample

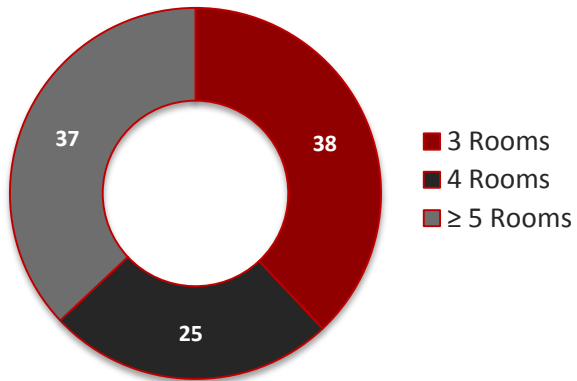
Household residents



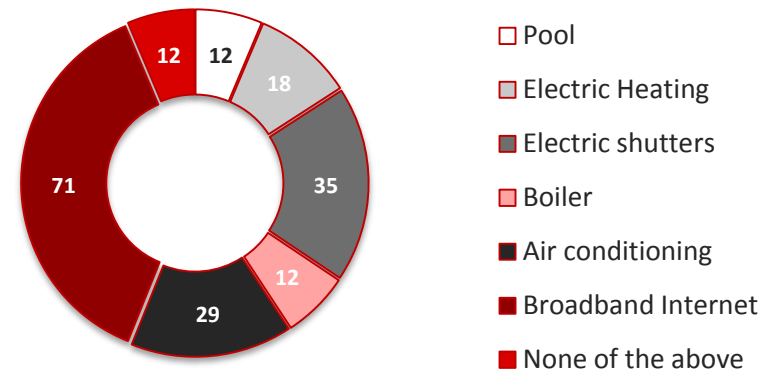
House Type



Number of Rooms



Appliances





EDP Gamification

Quantitative Study - Initiative 4

Lisbon, September 2015

DCMK

