End-user profile:

behavioral foundations of an energy control platform

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Ana Rita Farias (Ph.D) & Lena Holzner

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- ✓ ICT platforms allow users to control energy consumption, as well as optimizing its energy efficiency.

- ✓ In this day and age, this is a powerful tool for any user considering its remote real-time data access feature, thus permitting an energy consumption optimization, contributing to reducing *"smart cities"* energy related problems.

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- ✓ Generically, the energy-saving behavior is influenced by a large diversity of both behavioral and situational factors.
- ✓ Thus, the end user profile assessment is an essential tool to provide the foundations of the energy related platforms requirements and system.

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Pre-test Survey

1- Demographics

2- Attitudes toward energy saving
Environmental domestic routine behaviour

3 - Attitude toward nature

4 - Attitudes toward energy saving–
Behavioural changes perception

5 - Behavioural Changes
Incentives judgement

6 - Electric Vehicles
Users characterization

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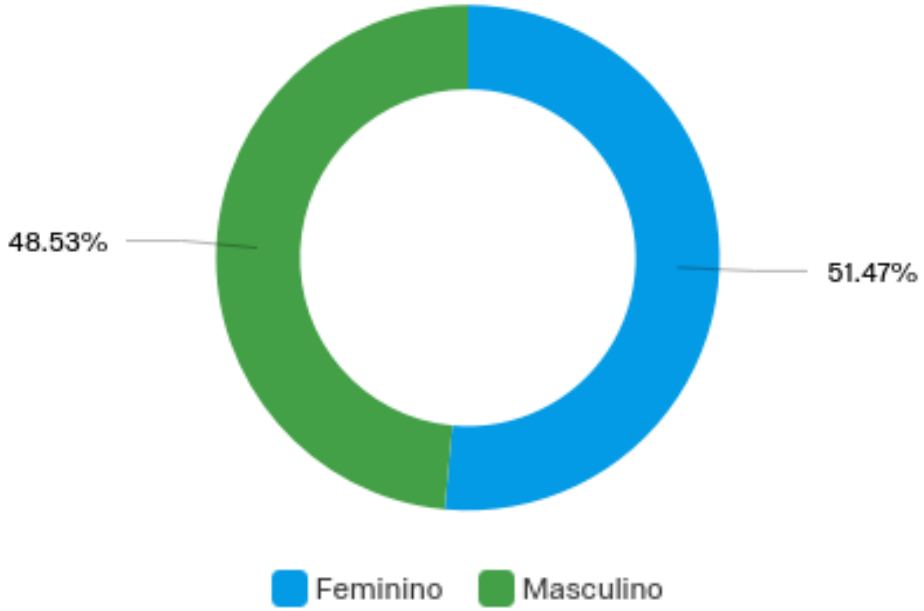
1- Demographics

N = 206

Mean Age = 46,96

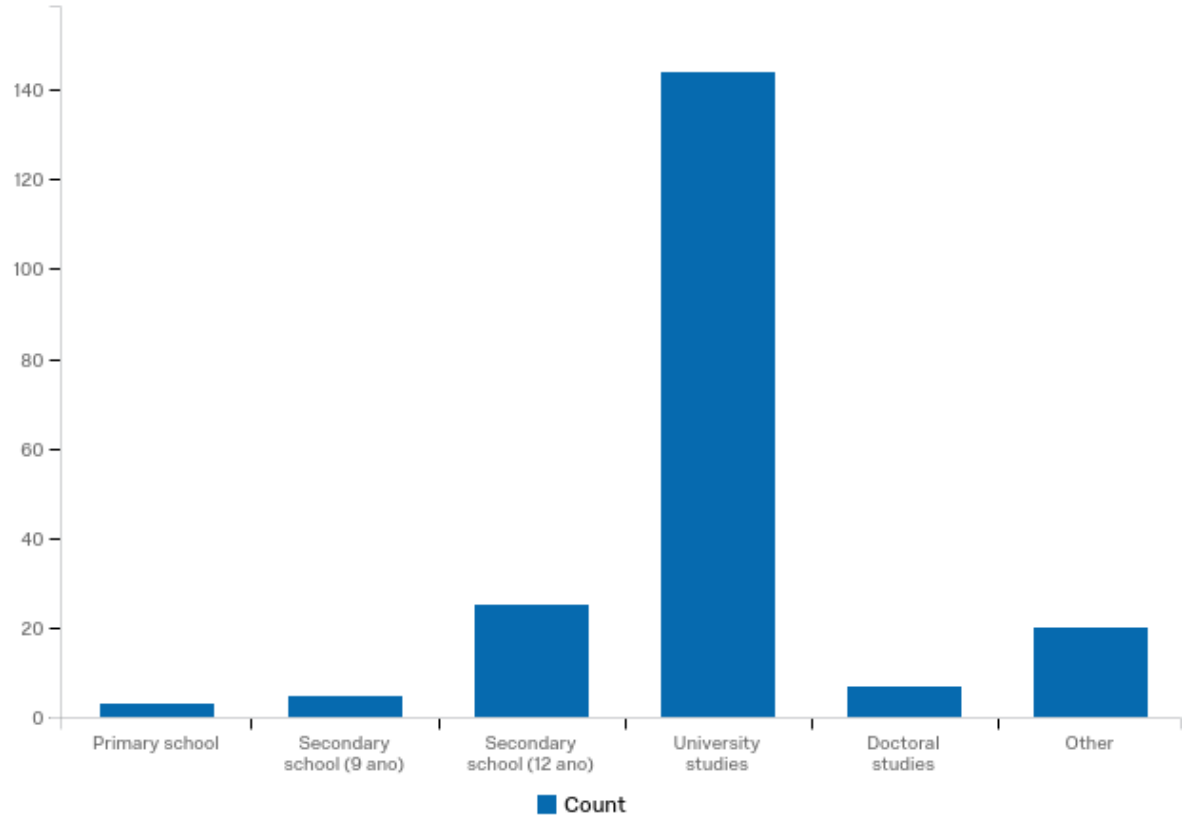
94,12 % never participate in any related pilot before

Gender



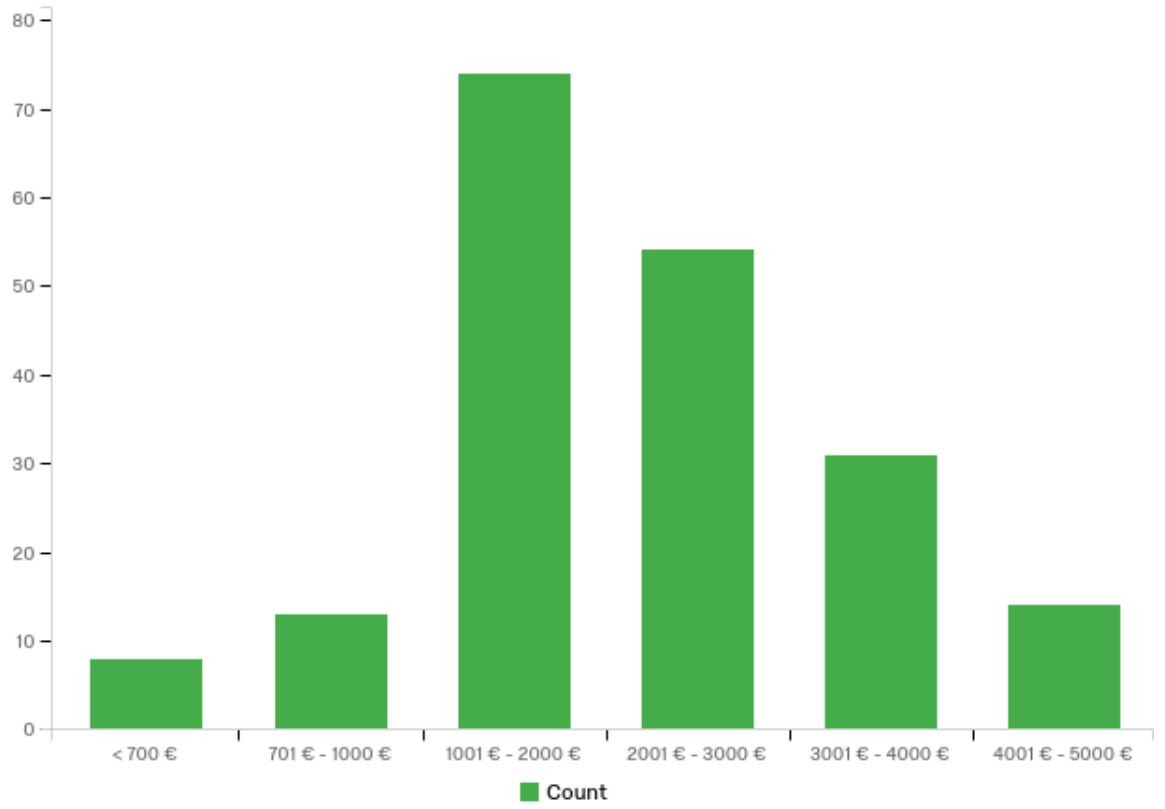
1- Demographics

Education Level



1- Demographics

Income



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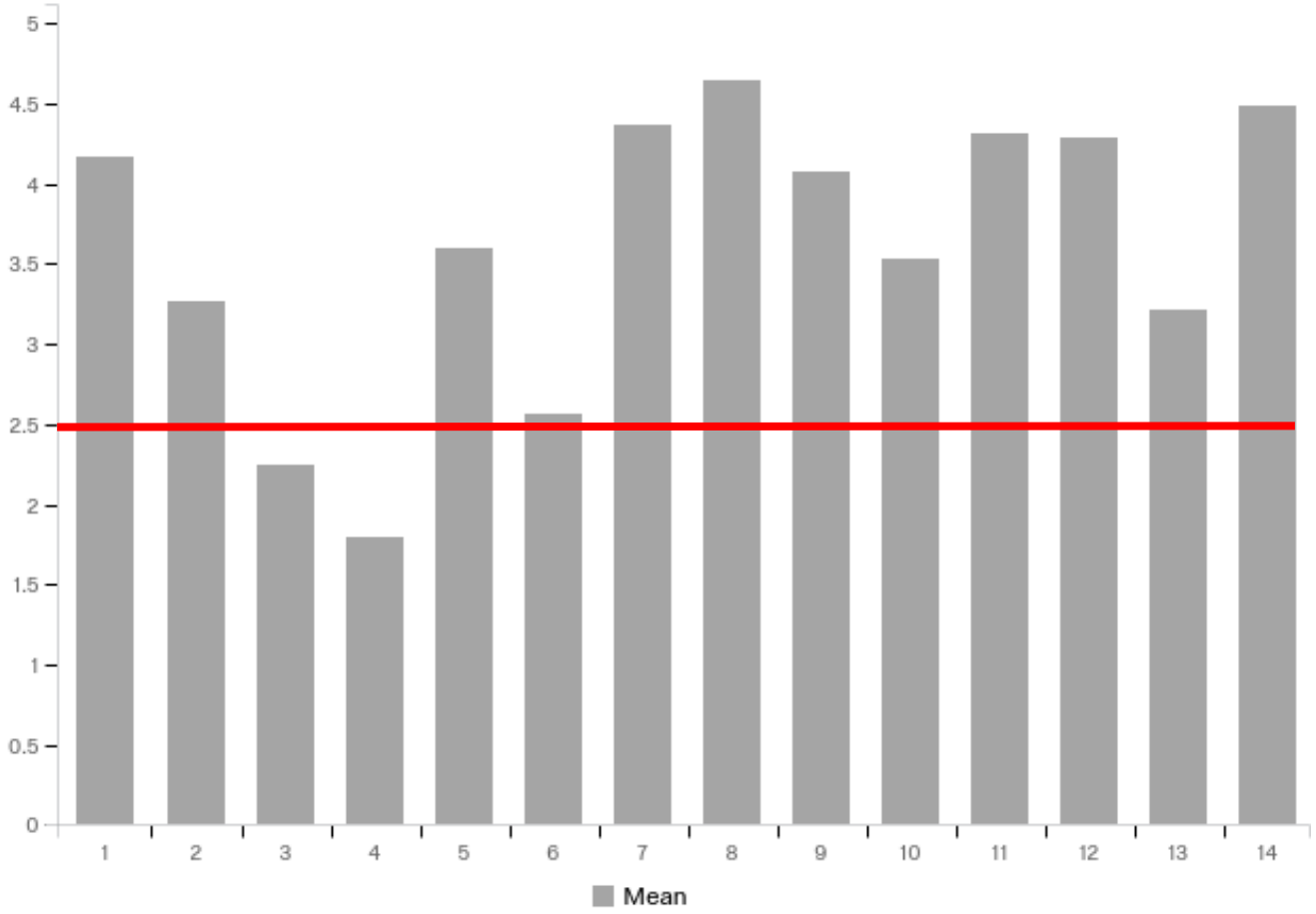
2- Attitudes toward energy saving
Environmental domestic routine behaviour

Please indicate how often you generally carry out the following activities:

(1- Never to 5 Always)

(Overall score could be calculated and compared with 4).



1- Use the standby mode for often used appliances;

2- Start the washing machine with only a half full load;

3 - Leave warm water running while brushing teeth;

4 - Close the door between heated and not heated rooms;

5 - Shower for more than 10 minutes;

6 - Leave the window tilted at night during winter;

7 - Switch off lights when leaving the room for half an hour;

8 - Put on warmer clothes before turning up the heating if it gets cold in a room;

9 - Wash clothes at times of lower price (i.e. at night);

10 - Switch off computer when it is no longer used;

11 - Switch off the light when leaving the room;

12 - Use a switchable power socket and switch it off when not using any appliances;

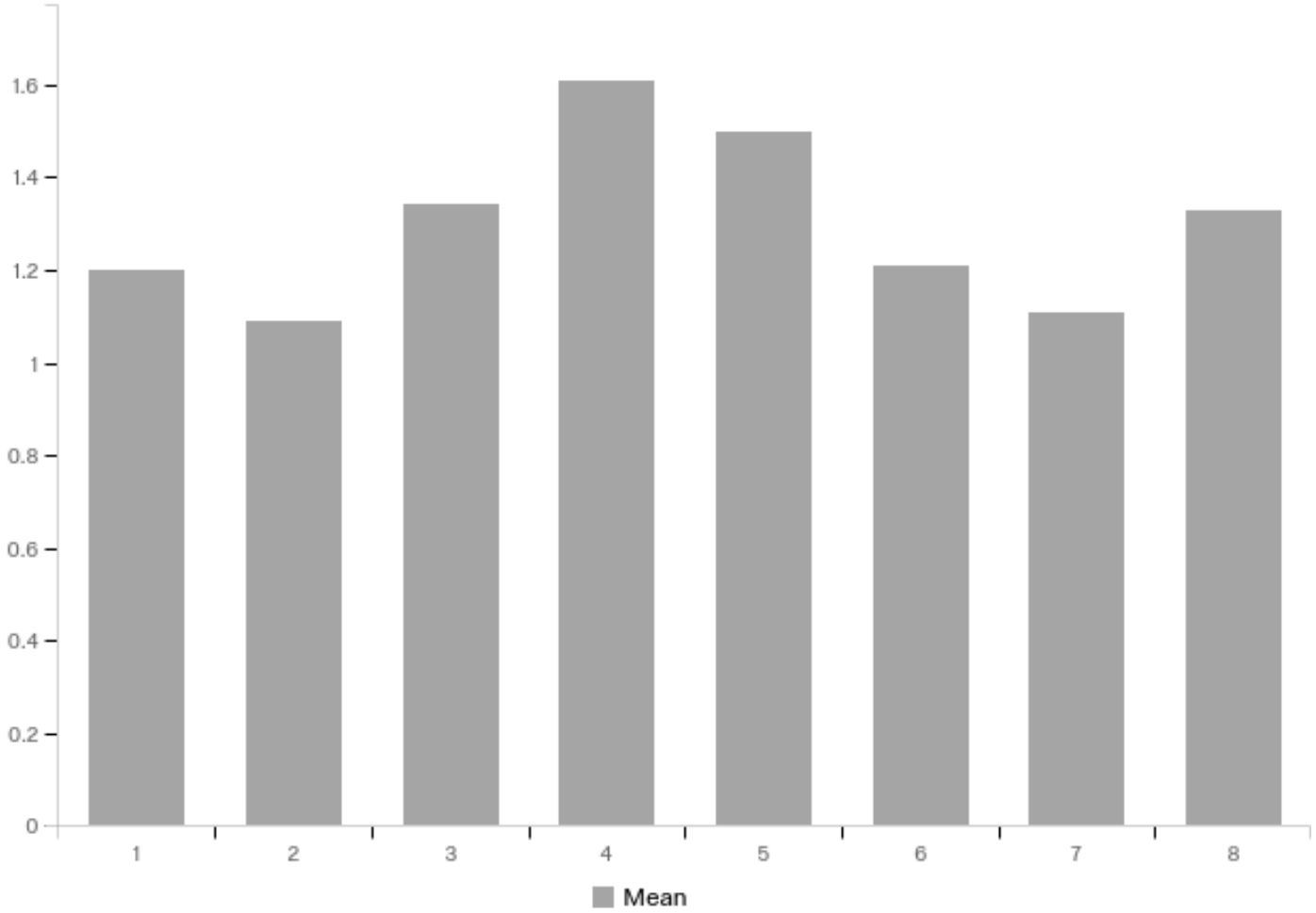
13 - Turn air conditioning (A/C) down during sleep hours;

14 - Use pots with lids for heating water and food;

3 - Attitude toward nature

Please select one level of agreement for each statement to indicate how you feel:

(1 - I completely agree to 5 - I don't agree with this at all)



1- We as human beings have to live in harmony with nature if we want to survive;

2- We have to conserve natural resources for future generations;

3 - Climate change will never stop if we carry on as before;

4 - If we carry on as before, energy will become increasingly scarce;

5 - For every kind of problem-solving, we always have to consider the consequences for the environment first;

6 - We should be careful not to disturb the balance of nature;

7 - Society should promote environmental protection;

8 - Environmental issues should have precedence in all government decisions;

Participants consider themselves green (enviromentally friendly).

4 - Attitudes towards energy saving – Behavioral Changes Perception & Behavioral Changes – Incentives judgment

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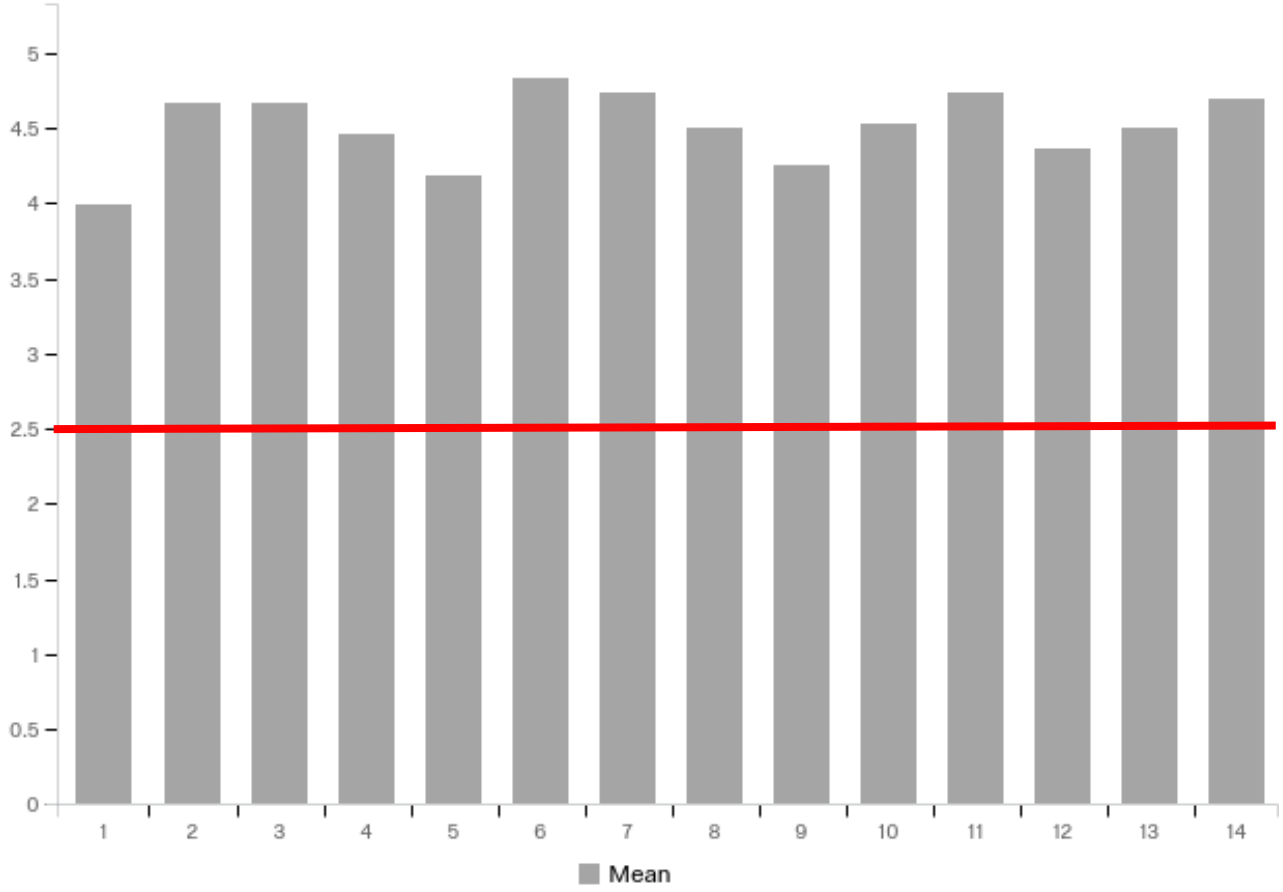
Please indicate how easily you would adopt the following behaviors:

(1 - Very hardly to 5 - Very easily)



1- Programming all my electronic appliances to work or charge it's battery on lower overload network schedules;

2- Performing washing cycles with maximum load;

3 - Turning off all lights when leaving a room;

4 - Taking short hot water showers;

5 - Brushing your teeth without warm water running;

6 - Using electrical extension cable or power socket with switch and turning them all off when electronic appliances are no longer in use;

7 - Turning off electronic appliances when no longer in use, not using the stand by mode;

8 - Closing of any door between heated and not heated rooms;

9 - Closing all windows in cold seasons;

10 - Dressing in multiple layers to keep your core temperature comfortably warm if it gets cold in a room;

11 - Turning off the computer when is not in use;

12 - Turning off all lights when leaving a room for a short period (e.g. half and hour);

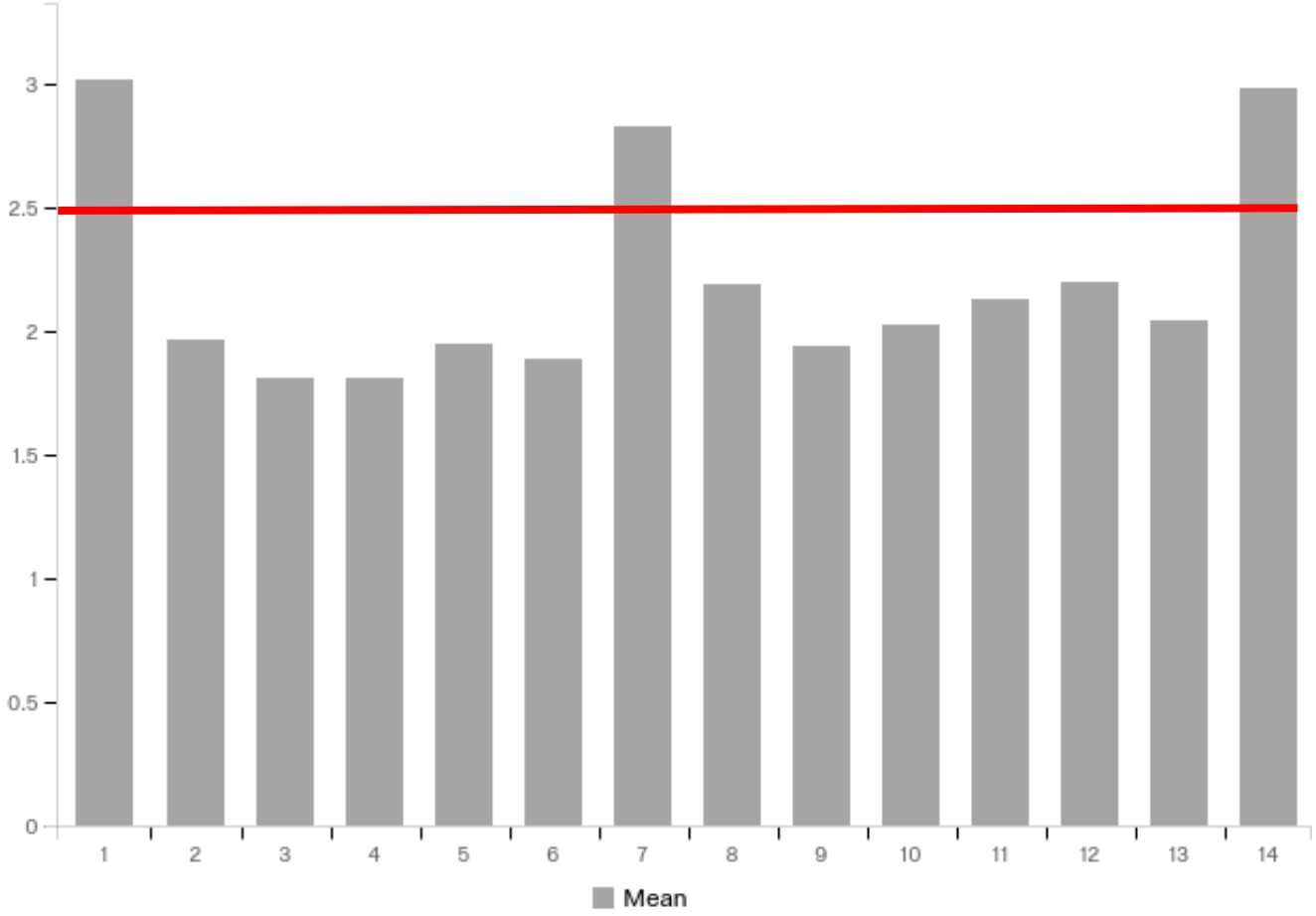
13 - Turning off AC two hours before go to bed;

14 - Using pots with lids;

4 - Attitudes towards energy saving – Behavioral Changes Perception & Behavioral Changes – Incentives judgment

Please indicate how much effective do you think could be each incentive

(1- Extremely effective to 5 - Not effective at all)



1- Information about your neighbors energy consumption efficiency

2- Energy consumption qualitative ratings. (e.g. low; moderate; high)

3 - Information about money savings.

4 - Track the consumption and coast of each device.

5 - Bill prediction indications based on actual consumption.

6 - Information about cost per hour/day.

7 - Participate in competitions or challenges that test your energy efficiency.

8 - Usage prediction indications based on actual consumption.

9 - Receive an email or sms always that is some unusual usage.

10 - Compare your consumption between past similar periods (e. g. seasons)

11 - Information about current usage rate (kWh).

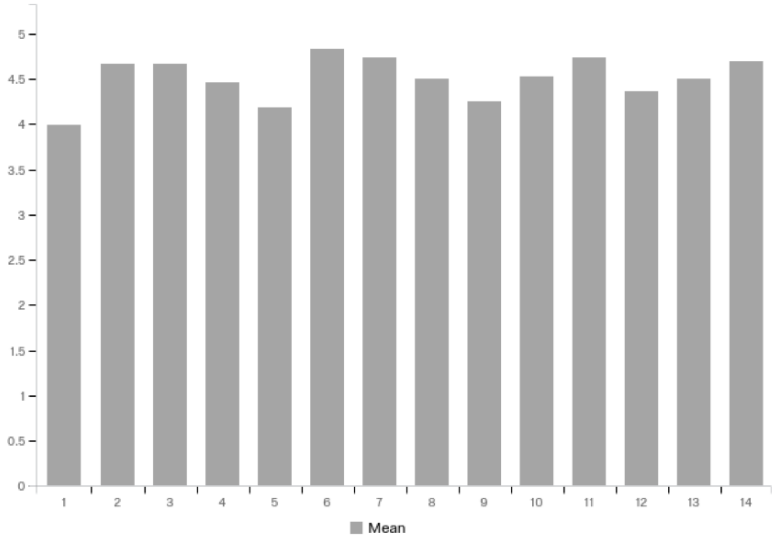
12 - Information about unit cost of electricity (€ per kWh).

13 - Information about the impact of your energy consumption on the environment.

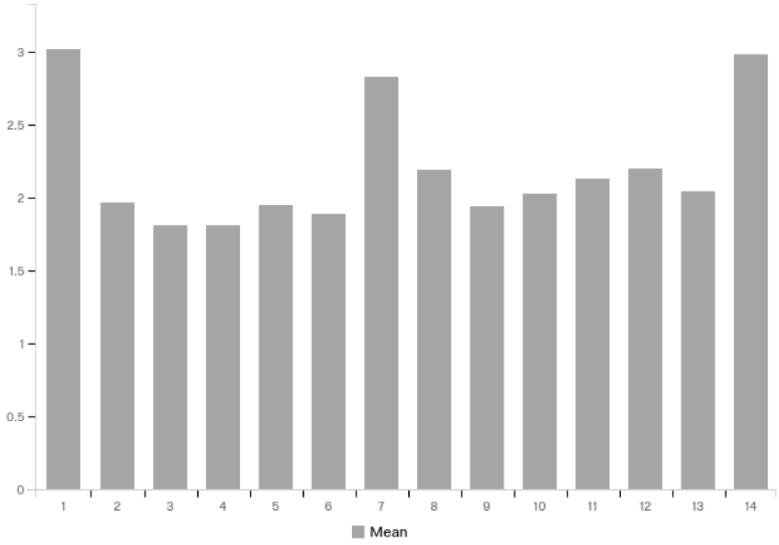
14 - Play an energy control online game.

4 - Attitudes towards energy saving – Behavioral Changes Perception & Behavioral Changes – Incentives judgment

Attitudes toward energy saving – Behavioral changes perception

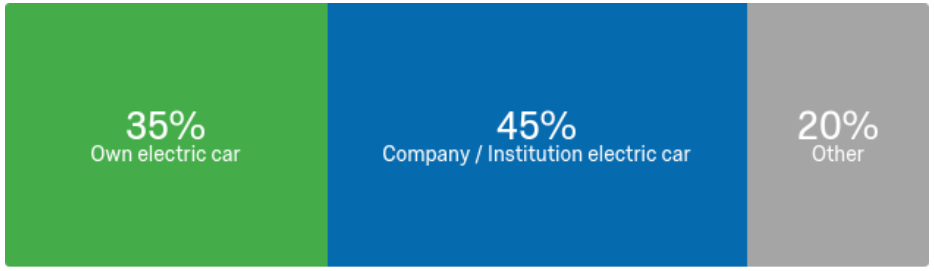


Behavioral Changes Incentives judgment

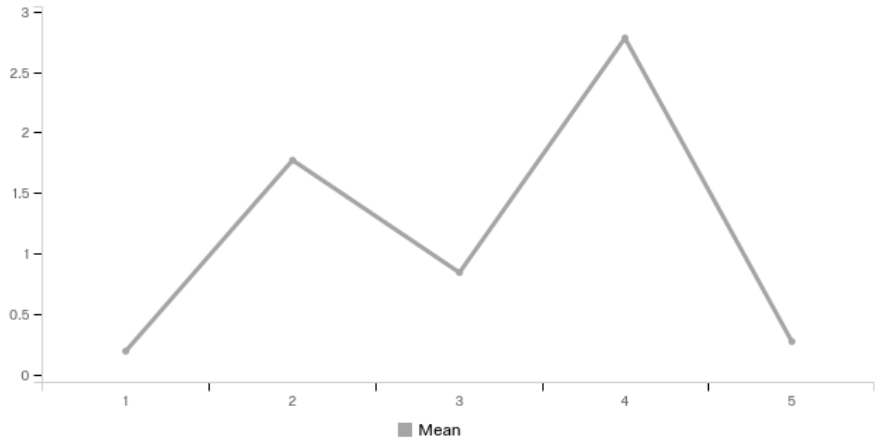


5 - Electric Vehicles
Users characterization

Which electric car you use:

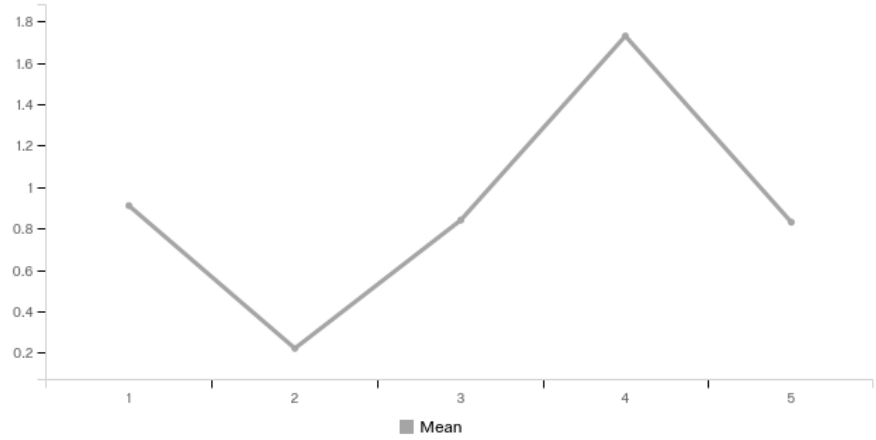


Please indicate, during a week, how many times you usually charge electric vehicles (EV) in each place.



1- At home, on a public charging point; / **2-** At home, on a private charging point; / **3 -** At work, on a public charging point; / **4 -** At work, on a private charging point; / **5 –** Other.

Please indicate, during a week, how many times you usually charge electric vehicles (EV) **during each period.**



1- morning; / **2-** noon; / **3 -** afternoon; / **4 -** evening; / **5 –** during sleeping period.

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Considering the results presented before, some main aspects that were considered are highlighted:

- ✓ Target population will be middle-aged, middle class/upper-middle class, with university degree or higher schooling level;
- ✓ Results gathered indicate a population segment clearly environmentally aware;
- ✓ It seems there is a current positive attitude towards energy efficiency that is not being translated into efficient behavior;
- ✓ EV drivers in particular seem to present behavioral patterns consistent with the peak hours, a behavior perfectly in line with this project's main goal;

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