



# User involvement in the definition of new ICT based services for energy



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4th May 2011, Lisbon

# User involvement in the definition of new ICT based services for energy

## LISBOA E-NOVA

### MISSION:

Contribute to Lisbon's sustainable development through the promotion and dissemination of good practice in energy and environment.

### AFFILIATES

25 Affiliates

12 Employees

5.500 Mailing list subscribers

50 Communication actions/year

25 Current projects

[www.lisboaenova.org](http://www.lisboaenova.org)



# User involvement in the definition of new ICT based services for energy

## LISBOA E-NOVA

### MAIN AREAS OF INTERVENTION



# User involvement in the definition of new ICT based services for energy

## LISBON'S ENERGY AND ENVIRONMENTAL STRATEGY

### Targets for 2013

Energy consumption reduction: 8.9%

Water consumption reduction: 7,8%

Losses in the water supply network: 15,6%

Reused water: 3.1 m<sup>3</sup>/hab.year

Materials consumption reduction: 10%

Selective materials recycling increase: 29%

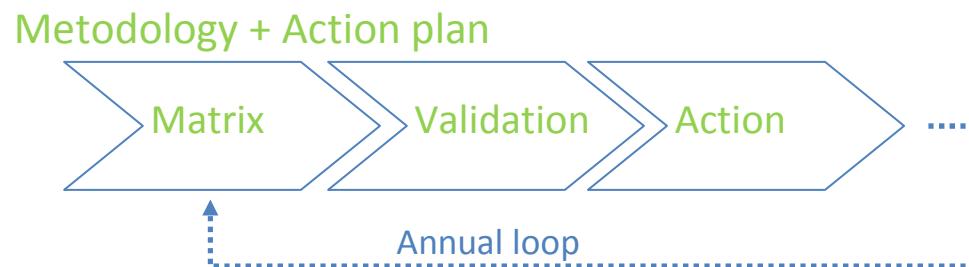
DGEG, valores provisórios



## LISBON'S ENERGY AND ENVIRONMENTAL STRATEGY

### MONITORING

Defined the performance goals of the Lisbon municipality on the horizon 2009 - 2013, it is necessary to ensure continuous monitoring of the actions that are developed within its framework to quantify and identify priority areas of intervention: update of the matrices energy, water and materials, and also noise and air quality.



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## LISBON'S ENERGY AND ENVIRONMENTAL STRATEGY

### CITIZENS PARTICIPATION

It's one of the Lisbon's Energy and Environment Strategy key points to increase citizens awareness and active participation in fulfilling the targets set for the city.

This is achieved through active awareness and communication campaigns, promotion of activities, workshops, debate sessions, etc.

DGEG, valores provisórios

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# User involvement in the definition of new ICT based services for energy

## LISBON'S ENERGY AND ENVIRONMENTAL STRATEGY

### PROMOTE USERS ENGAGEMENT PROVIDING DATA AND TOOLS UPON WHICH ONE CAN BUILD INNOVATIVE SERVICES

Create databases on the city's energy consumption in the various areas;

Promote open access to city data;

Nurture creative ideas, new services, built upon "new energy" concepts;

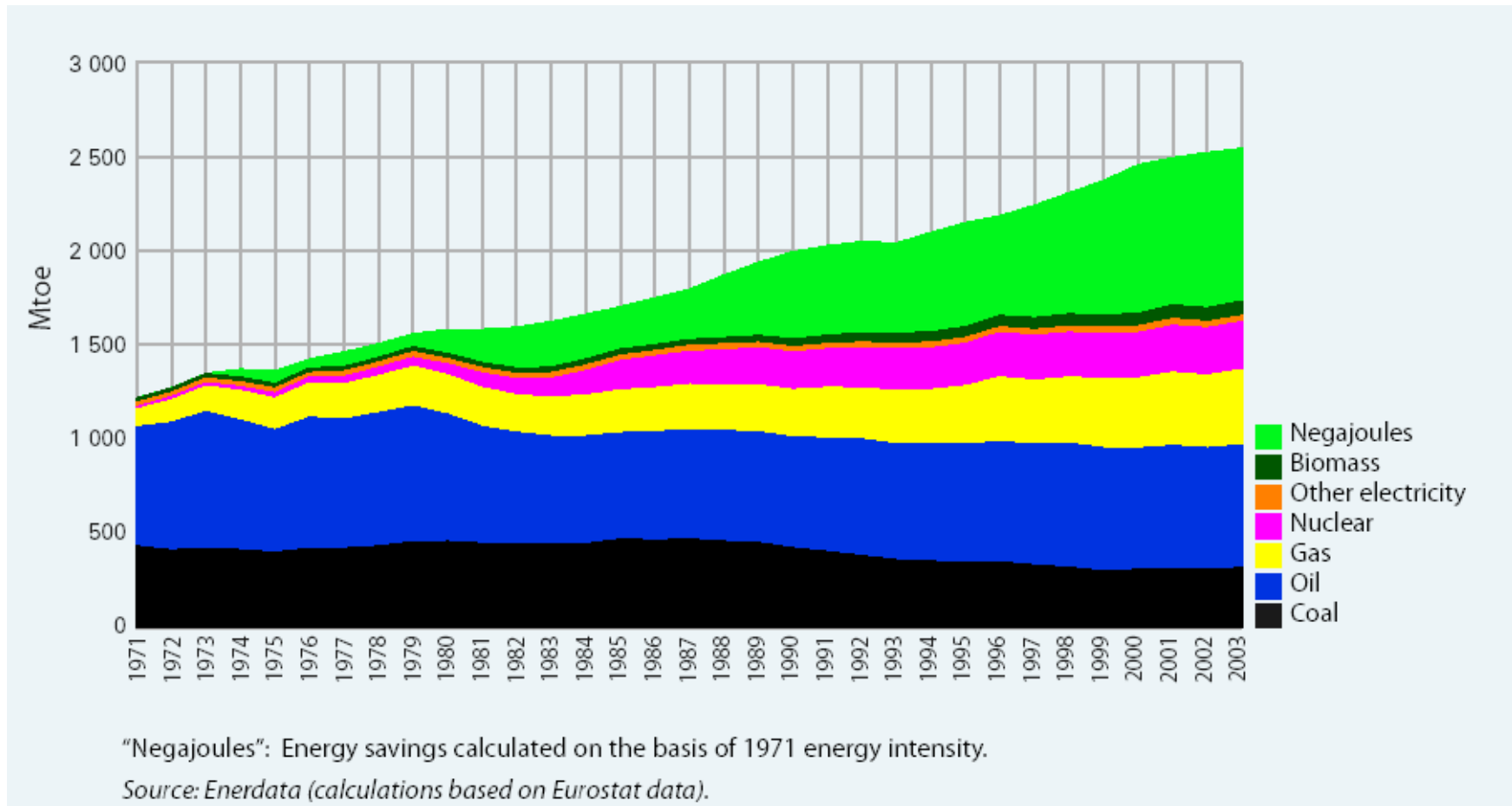
Promote the city as a partner in users actions as innovators;

Foster entrepreneurship in the energy area.

DGEG, valores provisórios

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## ENERGY EFFICIENCY – THE NEW ENERGY





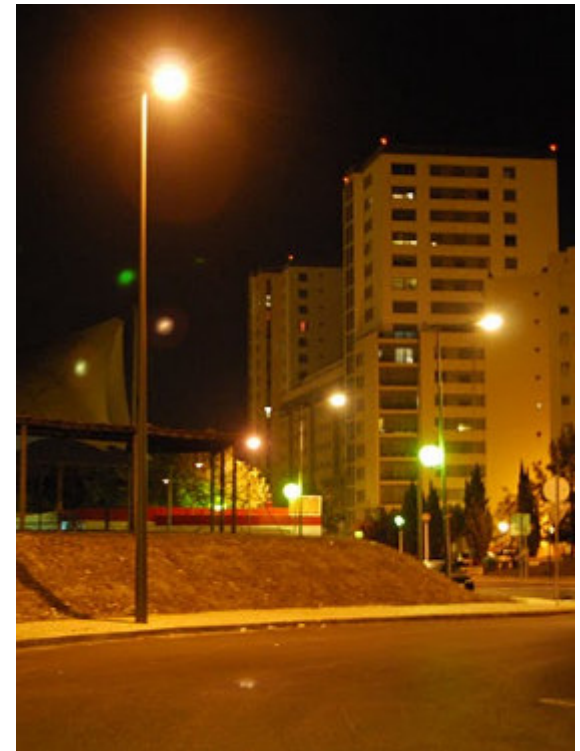
## TECHNOLOGICAL ACTIONS – Public lighting

### PHOTOELECTRIC SENSOR

- Began operating in 2008
- Consists in controlling the lighting of the public lighting by natural light instead of a fix schedule
- In 2009 the reduction was nearly 20 min / day.
- Energy saving energy and economic in 2009:  
1.6 million kWh and 0.1 million €

Available data:

- Schedule for on/off
- Illumination levels

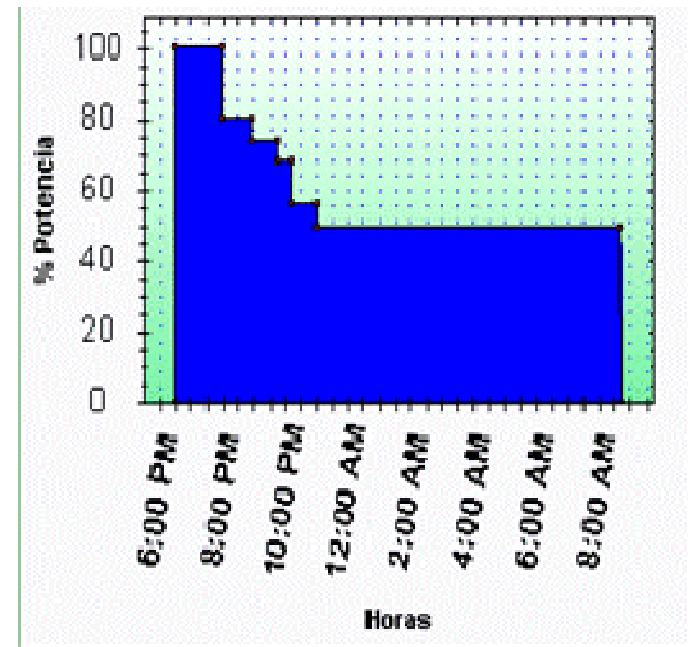


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## TECHNOLOGICAL ACTIONS – Public lighting

### ELECTRONIC BALLASTS WITH CONTROL FLUX REDUCTION

- Consists in replacing 1625 ferromagnetic ballasts by electronic ones,
- Energy savings: reduce electric consumption by 50%,
- Lisbon has about 15,000 lights that can also be replaced,
- Savings of 5 million kWh/y and 500.000 €/y,
- Investment payback between 3-5 years.



## TECHNOLOGICAL ACTIONS– Traffic lights

### LED IN TRAFFIC LIGHTS

- Center of Lisbon (Baixa, Rossio, Av. Liberdade)
- Consists in the substitution of the traditional lamps of traffic lights with LEDs
- Big energy savings (reduction of 90%), road safety and maintenance.
- Saving energy and economic for the 1<sup>st</sup> phase: 567 lights will save half a million kWh and 60 000 €.
- Lisbon has about 24,000 lights traditional lamps, and the savings potential 7 million kWh and 750.000 €.
- Investment payback between 3-5 years.

## TECHNOLOGICAL ACTIONS – Transportes and Mobility

### MOBI-E: ELECTRIC MOBILITY IN LISBON

Identification and installation of 687 charging points for electric cars in the city of Lisbon.

The first year is free of charge!

Interconnection with the public transports system;

Straight connection with smart grids and bi-directional energy flux.



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## TECHNOLOGICAL ACTIONS – Transportes and Mobility

### MOBI-E: ELECTRIC MOBILITY IN LISBON

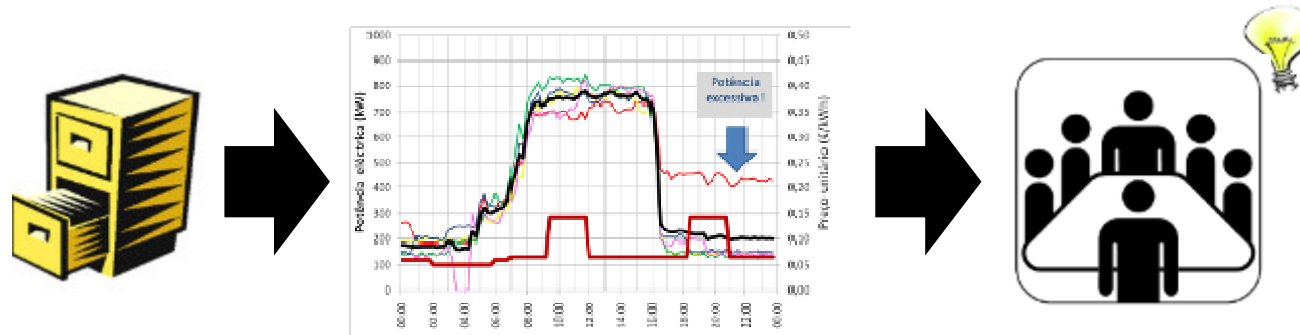
# User involvement in the definition of new ICT based services for energy

## TECHNOLOGICAL/BEHAVIOR ACTIONS – Office Buildings

### REMOTE MANAGEMENT – ELECTRICITY CONSUMPTIONS

In Municipal buildings and buildings of Lisboa E-Nova Associates analyze and monitor the electricity consumption patterns and present/discuss it with the building manager.

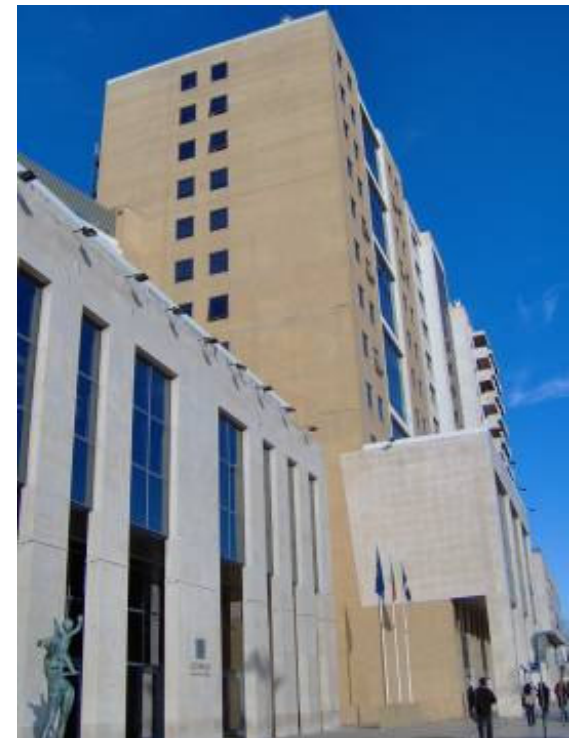
Promotes a better management of the building and the adequacy to electricity tariffs.



## BEHAVIOR CHANGE ACTIONS – Office Buildings

### SAVE ENERGY PROJECT

- Through the installation of 54 electricity meters, the pilot area of the building is continuously remotely monitored (at Lisboa E-Nova/ISA).
- The goal is to promote technicians' adoption of more energy efficient behaviors, inducing the reduction of electricity consumption.



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## BEHAVIOR CHANGE ACTIONS – Office Buildings

### SAVE ENERGY PROJECT

- The data collected is available to users through a real time data display and historical consumptions in a webpage.



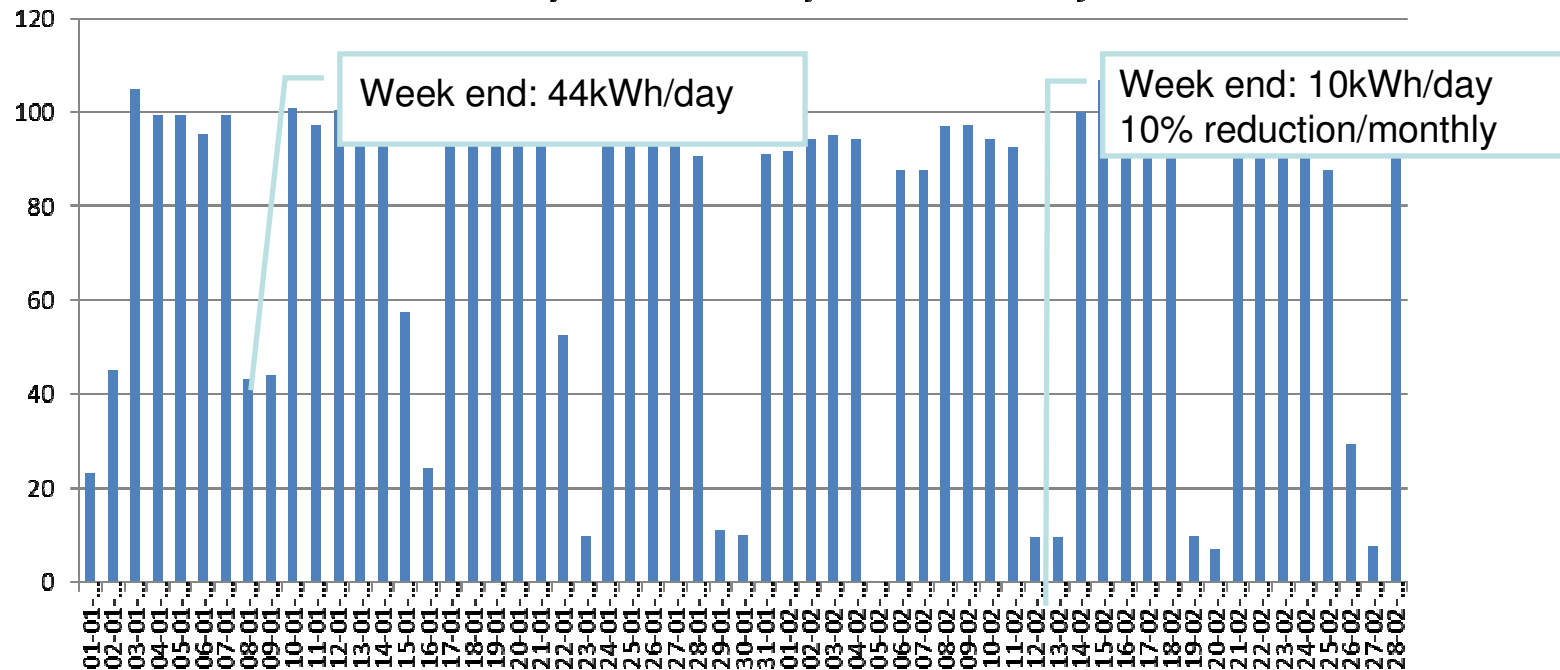


# User involvement in the definition of new ICT based services for energy

## BEHAVIOR CHANGE ACTIONS – Office Buildings

### SAVE ENERGY PROJECT

Consumption January and February



# User involvement in the definition of new ICT based services for energy

## BEHAVIOR CHANGE ACTIONS – Office Buildings

Users awareness on energy issues.

The questionnaire to the Municipality technicians::

### A - Interest in energy and energy efficiency

#### B - At the office

B1 - Behavior

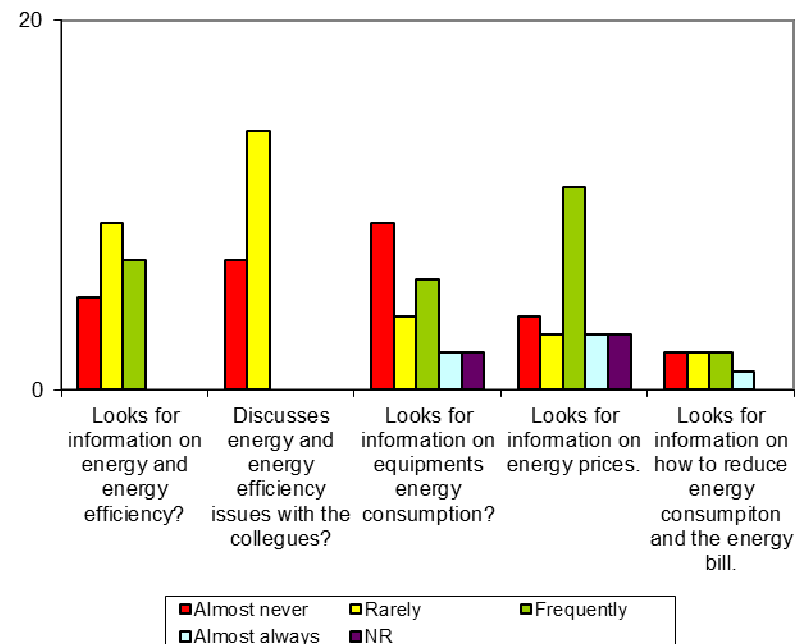
B2 - Knowledge on equipment power

#### C - At home

C1 - Electricity consumption

C2 - Knowledge on equipment power

Framework - 1B



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## BEHAVIOR CHANGE ACTIONS – Office Buildings

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A - Interest in energy/energy efficiency

**B - At the office**

**B1 - Behavior**

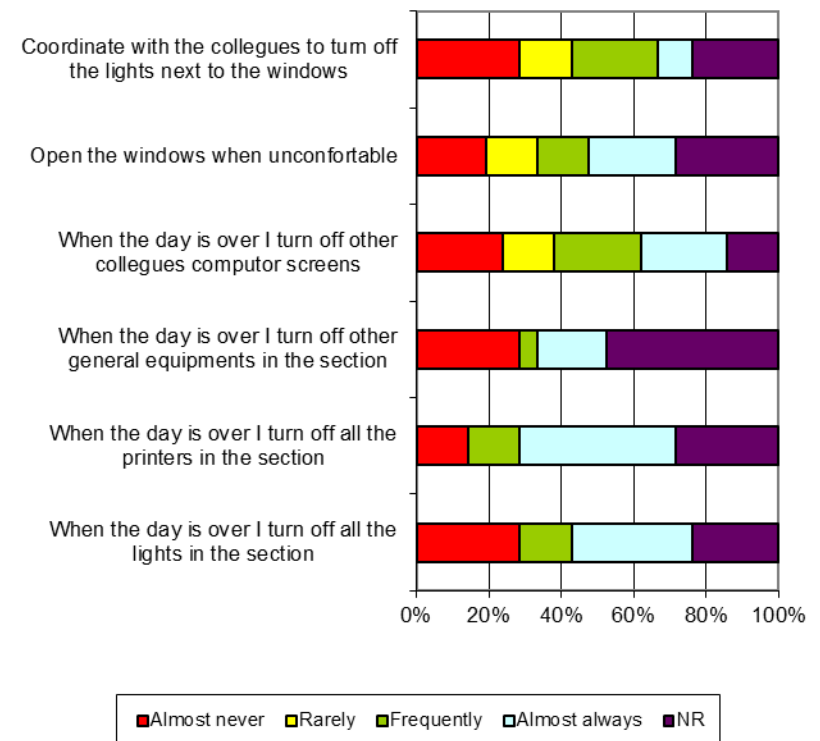
B2 - Knowledge on equipment power

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In my section - 1B



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## BEHAVIOR CHANGE ACTIONS – Office Buildings

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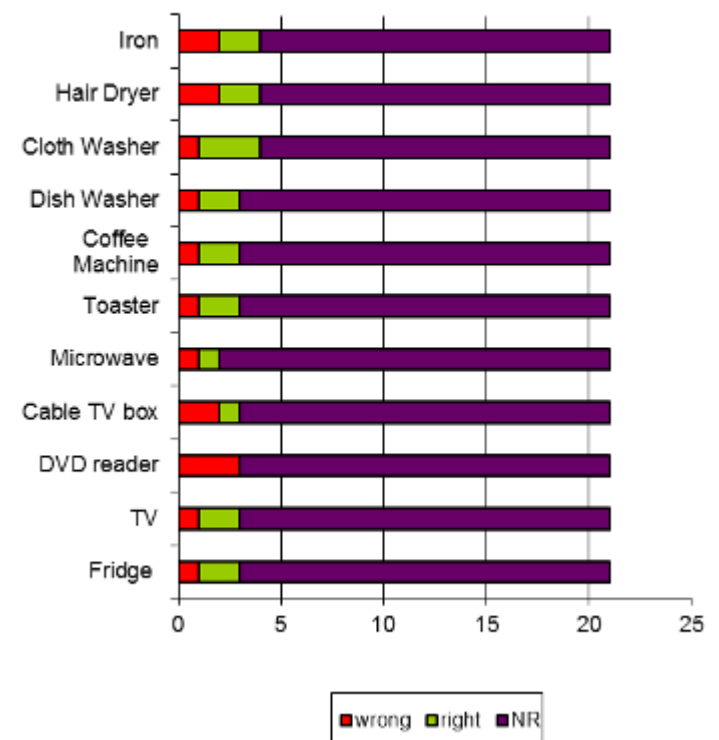
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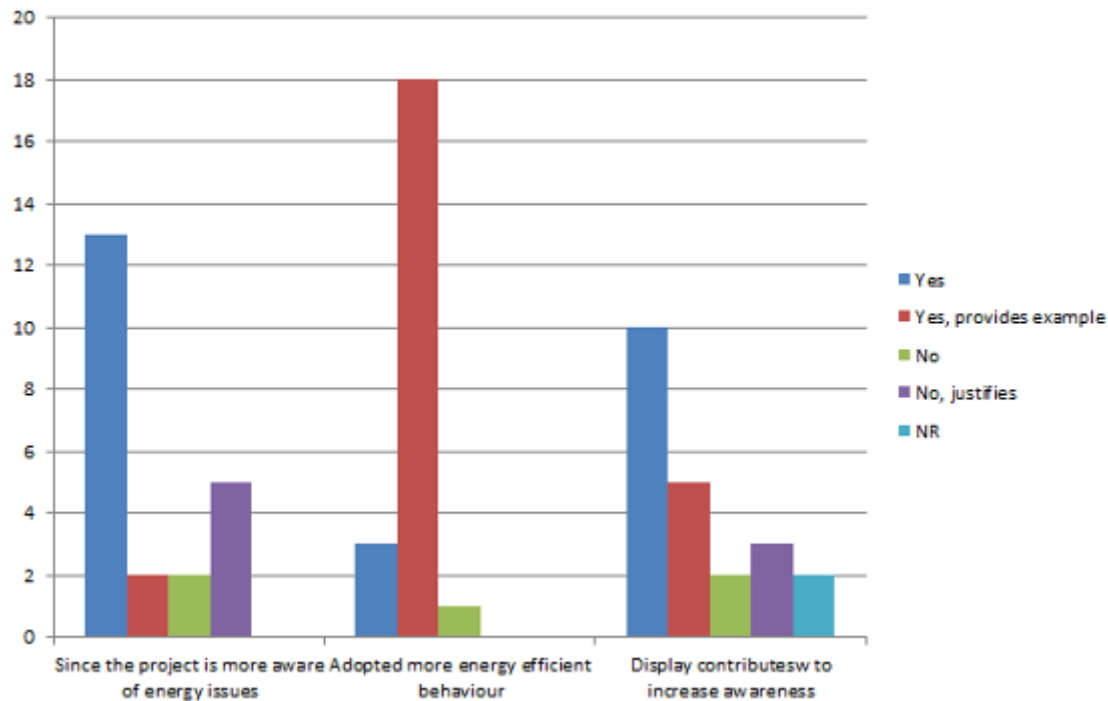
Domestic equipments power -1B



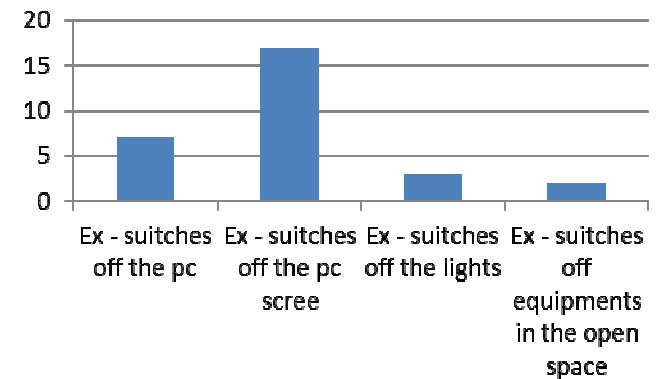
# User involvement in the definition of new ICT based services for energy

## BEHAVIOR CHANGE ACTIONS – Office Buildings

Users awareness on the Save Energy project.



### Adopted more energy efficient actions



## BEHAVIOR CHANGE ACTIONS – Office Buildings

### SAVE ENERGY PROJECT

- Continuous awareness actions are developed to promote users engagement to energy efficiency:
  - Applets with energy efficiency tips;
  - Electricity consumption plugs to experience at home;
  - Serious games on energy;
  - Information workshops;
  - Information and feed-back questionnaires



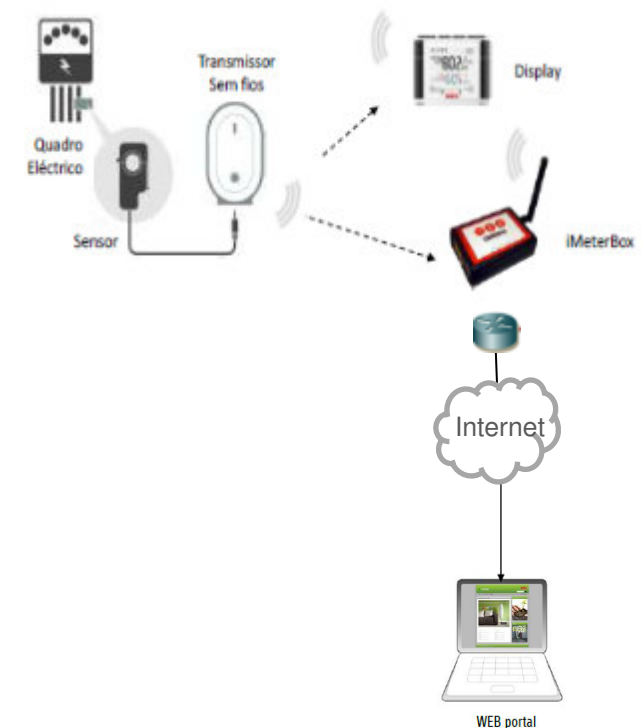
## BEHAVIOR CHANGE ACTIONS – Residential Buildings

### INTELLIGENT MONITOR FOR EFFICIENT DECISIONS

#### APOLLON PROJECT

Promote dwellers behavioral change through the installation of telemetry systems for electricity consumption and presentation of data in a local display and at a website.

- 250 dwellings will be in this study and a special effort will be developed in support to consumers based on analysis of personal consumption profile.
- Annual savings: 0,4 – 0,8 GWh/y  
Total investment: 250.000 € (supported by PPEC)



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## BEHAVIOR CHANGE ACTIONS – Residential Buildings

### INTELLIGENT MONITOR FOR EFFICIENT DECISIONS





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## BEHAVIOR CHANGE ACTIONS - Mobility

### INTELLIGENT AND SUSTAINABLE MOBILITY

- Identify the mobility matrix of a services municipal building and present efficient mobility solutions according to users needs and suggestions:
  - Carsharing (privileged parking),
  - Videoconferencing (in test),
  - Teleworking via common web based platforms;
  - Public transport information online (in development).



**Carpooling**  
CÂMARA MUNICIPAL DE LISBOA

**O que é o CARPOOLING?**  
Nas deslocações regulares entre dois locais, nomeadamente nas deslocações **casa trabalho casa** existe a oportunidade, para quem trabalha neste edifício, de poder partilhar o mesmo veículo

**A cidade agradece!**  
Com menos veículos individuais em circulação conseguem-se melhorias na qualidade do ar, na eficiência energética, no congestionamento do tráfego, no tempo dispendido nas deslocações e também nos respectivos custos.

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**Thank you for your attention**