crrescendo
NEW ENERGY FOR GROWING COMMUNITIES

Social and technical monitoring of cRRescendo demonstrations in Viladecans
cRRescendo evaluation meeting
Raquel Millán
Almere, 14th October 2011

This cRRescendo project has received valuable funding from the Community's Sixth Framework Programme. This publication reflects only the author's views and the Community is not liable for any use that may be made of the information contained in it.

Presentation

•**Socio-economic research**

•**Technical research**

Socio-economic research

Sector Torre Baja - Llevant
Font: BCN Ecologia

Sector Vilamarina
Font: BCN Ecologia

Sector Roure - Residencial
Font: BCN Ecologia

•Residential sector is responsible for 21% of total energy consumption in the city in 2005 (reference year).

•On 2005, emissions were 60.003 tCO2eq → 0,98 tnCO2eq/inhab.

•There are 4 main factors with direct influence in energy consumption:

•Building typology
•Physical and technical characteristics of the building
•Age of the building
•Human factor

Socio-economic research

•Saving potential in residential sector is very high

⬇

•Local Dwelling Plan 2008-2019
•Viladecans and its future projection analyze Report (2007)

How to save energy at domestic level?

heating:
- Passive solar
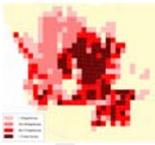- Better insulation

cooling:
- passive solar protection
- better insulation

SHW:
- restricting flow
- reducing set point temperature

lighting:
- Installing high efficiency lighting
- other saving systems

---

Socio-economic research

•333 surveys were done about energy consumptions at domestic level.

•Surveys were distributed in 5 different areas of the city according to building types.

•1 general part identifying the kind of dwelling, surface and number of people and 8 specific parts:

- heating
- cooling
- water
- lighting
- electrical appliances
- kitchen
- renewable energies
- invoices

Slide 1

Socio-economic research

- The most important uses are heating, cooling, hot water and electrical appliances.

Slide 2
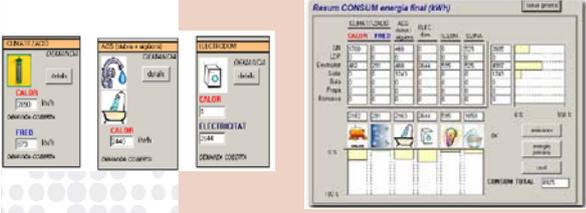
**Socio-economic research
Conclusions**

- Typical residential building is an apartment building with 97,5 m2 as average surface

- Average number of occupants: 3

- 60% of buildings date before 1980, 1979 is the average year of building

- Only 50% of dwelling have double glass in windows

- Natural Gas is the more used heating system (56%) followed by electric heating (22%)

Slide 3

**Socio-economic research
Conclusions**

- People use 5h/day of heating at 21,7ºC as average temperature

- 50% of dwellings have a cooling system used 4h/day during summer with 22,8ºC as average set point.

- Hot water most used system are natural gas boilers (76%) and butane (15%)

- People is aware of water scarcity but only 15% of them have saving water systems.

Slide 4

**Socio-economic research
Conclusions**

- Only 4% of dwelling have all the light bulbs efficient, 18% are high efficient combining fluorescents and high efficiency light bulbs and 79% have little or any efficient bulb.

- Regarding electrical appliances, 80% of people try to choose A type

- Solar thermal panels are still rare, just 2% of dwellings

Slide 5

**Socio-economic research
Conclusions**

- average consumptions are:

Concept	Consumption (kWh/year/dwelling)
Water (m3)	112
Electricity (kWh)	3.802
Fossil Energy (kWh)	4.543
Total Energy (kWh)	8.426

Slide 6

Technical research

- Majority of eco-buildings started to be monitored on October / November 2010

- Data are collected manually once a month for:

  - Total electricity
  - Total heat demand
  - Hot water demand
  - Cooling demand
  - Renewable electricity production
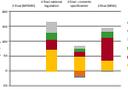 - Solar hot water production
  - Electricity PV production

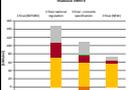**Preliminary conclusions**

BEST TABLE B – LA PINEDA DAY CARE

- Heat consumption is larger than Concerto specified because of hours that is opened

- Electricity consumption is lower than expected

- Cooling demand and hot water demand are more or less in line with the Concerto specifications

---

Preliminary conclusions
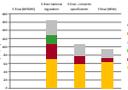
BEST TABLE C – CAN XIC YOUTH CENTRE

- Electricity consumption is very similar to what expected.

- Cooling demand and heat demand are even significantly better than the Concerto targets

- Cooling demand seems high

Preliminary conclusions

- **Best Table D – Pablo Picasso Auditorium:** It seems that there is a data collection error due to the short distance between regulation elements and meter. It is going to be modified.

- **Best Table E – Football field facilities:** The totals for cooling and electricity flows seem to be reasonably in line with Concerto specifications. (monitoring period is short)

- **Best Table F – Ponent School:** Building works started on March 2011 and classes and monitoring are expected to start on January 2012.

Preliminary conclusions

RES – PV PANELS

- Installations are tele-monitored by internet

- TV panels that show energy productions to visitors.

¡ thank you !