

## Motivations

### General questions:

- Kyoto and specific UE objectives to reduce the CO<sub>2</sub> emissions
- Peak oil problems and use of renewable sources (not always aligned with the sustainability concepts)
- EU willingness to improve the democracy and citizens participation into diverse levels and type of planning

### In particular:

Although the EU has started a series of initiatives (researches and projects) addressed to reach the Kyoto targets, what is emerged up to now from the studies conducted (analysis of reports, case studies and national legislation) is that energy plans are not designed at local scale (at least not in Italy), causing a separation between energy assessments and territorial issues<sup>1</sup>.

National or regional energy plans are thus conflicting with other plans and policies processed at local scale (transportation, housing, environment); furthermore, planners and administrators do not consider the energy planning as a complex system (it is not possible to attend only the improvement of energy efficiency)<sup>2</sup>.

The available information for citizens to direct their actions - choice of sources, services, building materials and directions on behaviour for energy efficiency and savings - are often misleading due mainly to the lack (clearness) of standard data and indicators. This lack causes a revealing distance between the problem and the citizens<sup>3</sup>.

The UE has launched a series of initiatives to increase citizens involvement in energy activities and strategies, but the level of participation is usually calibrated to "inform" and "aware"<sup>4</sup>.

## Objectives / hypothesis

Considering that the energy question at urban scale must be interpreted as a complex system<sup>5</sup>:

- various typology of information are required (geo and not)
- different actors have to be involved
- different phases and aspects are correlated<sup>6</sup>

the main research objective is the evaluation and studying of a "platform" (i.e. procedures, data, architecture) to manage information, parameters and behaviours, which is able to support and increase the interrelationships and the involvement degree among actors onto the local energy planning

Valued the great extent of the topic, I intend to start the study on the issue of energy efficiency in residential buildings.

Why GeoNT / GI? because they allow:

- to analyze heterogeneous data - quantitative and qualitative - and the current efficiency level (there are many models but they must be analyze into the territorial/urban context)
- to evaluate different trends - economical, climatic, environmental, behavioural, etc;
- to build assessments and monitor the plans and actions
- to compare data and parameters with other plans.

## Research questions

1) Which kind of approach should be adopted to increase the involvement degree of different actors in the redefinition of energy consumption and savings? (the question is the analysis and design of distinct participation mechanisms among subjects)

2) How to introduce this approach inside a technological platform? (the question is the analysis and design of different accesses, uses and interfaces)

2.a) What information do we have to collect? and how to share this information? (the questions are the use of different model, data sources and devices, how to share technical, scientific, popular and tacit knowledge and how to create/use an energy model compared with other urban data)

2.b) In which way do the users manage and compare data and information using the platform? (the questions are the use of interoperability systems and standards)?

2.c) How do we put the results into the official urban planning activities? (the questions are the mechanisms of monitoring and forecasting)

## Methodology

*First:* analysis of data, indicators and model used to calculate the energy efficiency for dwellings.

*Second:* analysis of territorial and environmental data related to the energy questions

*Third:* case studies analysis of citizens' involvement in improving energy efficiency, analysis of participation techniques and models

**Problems: which technique? Interview? I would like to define a systematic approach versus the analysis**

## Notes

<sup>1</sup> **3-NITY Qualitative objectives.** “National governments have established national schemes and initiatives to cope with the climate challenges. However, national initiatives are rarely linked with local mandates. As a general consequence, local authorities do not have the necessary legislative instruments, they do not possess the required knowledge, and finally they do not have the financial or human resources available. The consequence is that the potential they represent will not be fully real”. <http://www.ieepprojects.net/index.html>

<sup>2</sup> **ENOVA - Municipal energy and climate planning.** “Conversion and distribution of energy are often associated with both loss of energy and greenhouse gas emissions”.  
[http://www.managenergy.net/download/Norwegian\\_Guidebook\\_for\\_Municipalities.pdf](http://www.managenergy.net/download/Norwegian_Guidebook_for_Municipalities.pdf)

<sup>3</sup> **JRC - Towards additional policies to improve the environmental performance of buildings:** Energy efficiency measures are often affected by uncertainties concerning the measurement and verification of the energy-saving, resulting from a lack of **standardised measurement and verification protocols**. Consumers and investors sometimes mistrust information on energy efficient technologies because they were previously misled by faulty technologies or they obtain conflicting information from different sources. Often there is also an operational risk that energy-savings may degrade over time, especially if the equipment is poorly maintained. <http://ftp.jrc.es/EURdoc/JRC50149.pdf>

<sup>4</sup> [http://ec.europa.eu/energy/intelligent/projects/index\\_en.htm](http://ec.europa.eu/energy/intelligent/projects/index_en.htm)

<sup>5</sup> **UNEP - BUILDINGS AND CLIMATE CHANGE. Status, Challenges and Opportunities.** “In conclusion, buildings should be designed with due consideration to factors such as local climate, transport distances, availability of materials and budget, balanced against known embodied energy content.”  
<http://www.unep.org/Documents.Multilingual/Default.asp?DocumentID=502&ArticleID=5545&l=en>

<sup>6</sup> **Adalberth, Karin (2000). Energy use and environmental impact of new residential buildings. Diss., Report TVBH-1012, Dept. of Building Physics, Lund Institute of Technology, Lund.**

“Buildings have an environmental impact during their whole life-time including the construction phase, use-phase and demolition-phase with a considerable impact during the use-phase”

## Other suggestions:

### GIS and efficiency

- EcoGis: <http://www.ecogis.info/projekt.html> in german language
- GIS and energy efficiency. <http://www.ingegneri.cc/blog.php?id=474> in Italian language
- Beeps Building Energy & Environment Performance System <http://www.cibse.org/pdfs/2dsantoli.pdf>
- Goteborg GIS and energy:  
<http://www.scribd.com/doc/6647357/Potentials-for-Solar-Energy-Applications-in-the-Existing-Building-Stock-of-Goteborg> <http://proceedings.esri.com/library/userconf/proc05/papers/pap2244.pdf>
- Cardiff: 3D models reveal energy from waste facility:  
[http://www.agi.org.uk/pooled/articles/BF\\_NEWSART/view.asp?Q=BF\\_NEWSART\\_311563](http://www.agi.org.uk/pooled/articles/BF_NEWSART/view.asp?Q=BF_NEWSART_311563)

### CITIZENS involvement

- "Bet to win!" - the climate competition between municipalities and their citizens (ENERGY NEIGHBOURHOOD).  
<http://www.energyneighbourhoods.eu/>  
<http://www.energienachbarschaften.eu/de/>
- **Energia Game:** <http://litago.mediafarm.no/3nity/energyBalance.html>
- BELIEF [http://ieea.erba.hu/ieea/page/Page.jsp?op=project\\_detail&prid=1444](http://ieea.erba.hu/ieea/page/Page.jsp?op=project_detail&prid=1444) <http://www.belief-europe.org/>