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Building Sector Policy Integration in Emilia Romagna Region Multi-Level Coordination of Actions to Reduce and Control Energy Consumptions in Buildings

1. Introduction

Complexity of sustainable development, even if concerning a particular building sector, in its main components, social, economic and environmental, requires proper connection among different administrative levels and simultaneous coordinated use of the several available management tools.

Such connection should lead to a framework of plans, recommendations, regulations and laws that consent to better achieve sustainability targets, provided that, upstream, there are directive and coordination acts able to define tasks and responsibilities, but also guidelines to manage, control, and assess energy-environmental effects in the whole decisional process.

In order to aid public authority, research efforts should focus on:

- Connection among all government institutional levels (Central Ministers, Regions, and Local Authorities) and among them and various stakeholders, through participation and cooperation, operational technical -administrative tools and their environmental integration in all the sectors involved.
- Experimental application of sustainability models and assessing methodologies: the present trend is to detect applicability of eco-management, environmental performance assessment tools, environmental accounting schemes, green-labelling and declarations (in a Life Cycle Analysis approach). Also authorization schemes, used to assess plans and programs (SEA¹) have now being adapted to a lower scale. All these tools and schemes make use of indicator systems which can allow decision makers to check feasibility *ex ante*, to adjust targets *in itinere*, and to check their achievement and stakeholders needs satisfactions *ex post*.

¹ Programs and Plans in the Region are already regulated by a proper SEA scheme, called *VALSAT - Valutazione della Sostenibilità Ambientale Territoriale* (art.5 of Regional Law No. 20, 24.03.2000), that precedes European Commission Directive No. 42/2001- *Directive on Assessment of Environmental Effects of Certain Plans and Programmes*.

- Identifying stakeholder roles (politicians, economists, administrators, city planners, sociologists, financiers, enterprisers, category associations of Workers, etc.) in the process and in informative networks and optimizing their interaction.

Through a well thought-out set of interventions and a proper *Deliberation*², Regione Emilia Romagna³ is disseminating and encouraging energy saving, rational use of renewable energy sources, enhancing, at the same time, environmental compatibility and safety conditions of heating equipments and building systems and also assuring quality of services and social well-being.

The execution of the Deliberation is performed by a *Tavolo di Confronto e di Coordinamento Tecnico* (Table of Technical Comparison and Coordination) which is run by Regione⁴, where all Local Authorities take part. At the Table ENEA⁵ is engaged, as technical secretary, following a long lasting collaboration with the Region.

The paper will show the complicated scheme of actions, highlighting, in the specific case of Emilia Romagna Region and building field, capacity of sector integration of sustainability issues and interactions between Public Institution and Research.

2. A Tool for Multi-Level Coordination

Through the Deliberation No. 387/2002 dating 18/3/2002- *Prime disposizioni concernenti il coordinamento dei compiti attribuiti agli Enti Locali per il contenimento dei consumi di energia negli edifici* (“First Instructions on Coordination of L.A. tasks in order to control energy consumptions in building”), Regione built a programming tool that can implement and coordinate environmental integrated policies in the construction sector.⁶

2.1 Targets and Authority Sphere

Civil sector is responsible for nearly 22% of regional energy year consumptions, as regards housing energy final uses, and for nearly 12%, as regards tertiary sector, so causing a high percentage of CO₂ emissions among all human production activities. About 2.600.000 tons of equivalent oil, of nearly 12.000.000 consumed ones, come from building HVAC (1998). Heating is the main cause of consumptions in residential sector (70%), followed by sanitary water (20%) and electric consumptions for household appliance and lighting (10%); also heating in tertiary sector is significant (50%).

² Deliberation of Regione Emilia Romagna, No. 387, 18/3/2002 - *Prime disposizioni concernenti il coordinamento dei compiti attribuiti agli Enti Locali per il contenimento dei consumi di energia negli edifici*

³ Regione Emilia Romagna, Northern Italy, <http://www.regione.emilia-romagna.it/>

⁴ Responsible: Pier Antonio Rivola, *Assessorato Programmazione Territoriale, Politiche Abitative. Riqualificazione Urbana*, Regione Emilia Romagna.

⁵ ENEA, *National Agency for New Technologies, Energy and the Environment* (<http://www.enea.it>)

⁶ The *Deliberation* refers to Italian Law 10/91 on *General prescriptions concerning reduction of energy consumptions in buildings*. In particular, point 33 gives the Councils the task to control compliance to Law 10 in case of works, changes, installations, in buildings and relative equipments. Point 31, comma 3 of the same Law gives Councils with more than 40000 inhabitants and Provinces, for the rest of territory - the task to check at least every 2 years – compliance with standards on combustion of heating equipments. National Decree 112/98 *Conferimento di funzioni e compiti amministrativi e dello Stato alle Regioni e agli Enti Locali* (“Conferring State administrative tasks to Region and Local Authorities”) gives Regions the task to coordinate L.A.s in putting into effect D.P.R 412/93 on heating equipments in building, to assist them in advising final energy users, to coordinate training for operators in design, installation, operating, maintaining, checking heating equipments.

Regional programs on experimental building demonstration allowed to increase technical and design proficiency and to improve recommendations, as well as to draw institutions and market attention to rational use of resources and eco-system quality of building settlements.

Proper standards for public residential buildings (Regional Law No. 48/84), Council Codes of Practice (Regional Law No. 33/90), urban and territorial planning tools (Regional Law No. 47/92 and 30/96), and standards for building refurbishment and urban rehabilitation (Regional Law No 6/89 and 19/98) have also been experienced.

Several (25.000) projects have been funded with the result of 300.000 tons of equivalent oil energy saving. Projects concerned existing building insulation, high performance boilers and heat pumps installation, solar panels, integrated control systems, differential energy consumptions computation systems, development of heating equipments for production, distribution of energy coming from cogeneration, renewals use, or urban tele-heating networks.

Despite achievements, energy performance of regional housing system is below national average (+16.7 % than average consumption per occupied house, +24 % than average consumption per house square meter, 1998).

General regional instructions for energy policy indicate the following targets:

- decreasing energy consumption at equal social well-being and services supplying;
- improving environmental compatibility and safety of building heating systems in production, transformation, distribution, use;
- achieving global climate change targets imposed by Kyoto Protocol.

According to Kyoto Protocol, in fact, Regione Emilia Romagna aims to decrease CO₂ emissions from civil sector in the measure of 1.4 million CO₂tons/year, with an economic investment that amounts to 4000 million EUR within 2010.

Energy saving target at 2010 is 550.000 tons of equivalent oil compared to consumption increasing trend, 330.000 tons of equivalent oil concerning residential sector, so avoiding 700.000 CO₂ tons emissions.

To achieve these targets *Deliberation* puts into practice:

- A system of rules and recommendations which are coherent to energy performance improvement in buildings and cities, by harmonising technical standards and Council building codes of practice (*Regolamenti edilizi*);
- Integration of targets above mentioned and sustainable development principles in territorial ad urban planning tools;
- Harmonization of sector policies and funding systems;
- New connection and integration forms among different government levels, in order to guarantee public expenditure correctness and efficacy of administrative actions⁷;
- Incentives to stimulate market, new projects and sustainable development (use of renewables, rational energy use, eco-building systems and bio-architecture, distributed energy production) and their integration in the whole urban and building process;
- Better information and communication to citizen, designer, operator, etc.

Inhabited houses, in the *Region*, are about 1.500.000. Only 18% of them were built after 1978: energy retrofitting still seems to be one of the most effective policies, in spite of expenditure possibilities of owners, slow public reimbursement and present market features.

Moreover, recent studies showed that new buildings- in the case they are well designed - can demand even 50% energy less than old ones.

⁷ Regional Law No. 3/1999 (in compliance with National Decree No. 112/98 mentioned) shares functions and tasks concerning *Energy* among Region, Provinces and Councils.

Also, in the last period a deep evolution of rules and standards occurred - dealing with building, urban planning, energy and environment – and also new tools and responsibilities have recently been outlined.

The coordination programme described in the *Deliberation* deals with all links and relationships among possible actions at local and regional level.

Region has, mainly, coordination and programming tasks, and promotes adoption of connection tools that can allow different levels of government cooperation and coordinated action for what concerns HVAC systems in buildings.

Negotiation tools also involve private institutions and actors who are in charge for different building heating systems aspects and life cycle phases.

They are mainly programme agreements and prototype contracts on coordination and connection actions of energy and environmental saving: these actions will be shared and participated - but also optimised and supported - by proper regional funding.

Economic grants have already been supplied to promote some relevant local projects that can contribute to achieve the *Deliberation* targets or have a clear demonstration worth.

Deliberation targets meet the new *Directive 2002/91/EC on Energy Performance in Buildings* that invites Member States to create a unique energy performance calculation method, common threshold standards, energy labelling of boilers and air conditioning equipments. Finally, the *Deliberation* wants to orientate all building process stakeholders through territorial responsible Authorities in order to qualify design, construction, and management operations.

2.2 Regional Relevant Projects

In 1999 *Regione* started an *Action Plan to get a set of regional relevant projects*⁸ for saving and rational use of energy, use of renewables and decreasing greenhouses emissions. Projects have already been selected and are just starting. Coordinated undertaking by various dimensions and actors of the policy process is promoted in order *Regione* can achieve Kyoto Protocol targets and satisfy *Regional Energy Plan*.⁹ Besides, other regional initiatives play a part in the regional coordinated action and are predicted by the *Deliberation*.

Emilia Romagna Region direct actions
Regional Information Campaign on energy saving and maintenance of house heating equipments (Communication Plan). Meetings, pamphlets, posters, Mass-media (Radio, TV Spots, Televideo), Press Conferences, Media Relations for Newspapers, WEB site (http://www.regione.emilia-romagna.it/caldaiasicura/12.htm)
Regional project for fitting building heating equipments, with the stimulation of private enterprises and stakeholders to implementation and monitoring of energy policy. Focal tools to achieve participation through proper agreements and a final <i>Services Chart</i> on relationship among users, service enterprises and Local Authorities
<i>Energy Agencies</i> , in order to aid and inform citizens, train operators and designers, check heating equipments and energy systems. Creation of a <i>Register of Certified Operators</i> . Building "Sportello unico" (Building Unique Counter), for information service, building licences and certifications issue. <i>Regional Agency for Energy</i> - predicted in <i>Regional Energy Plan</i> (draft).
Conventions with ENEA

Figure 1: Table showing some Regional initiatives recommended in the *Deliberation*

Convention with ENEA indicates the following research and agency roles:

1. *Regional Energy Balance*. It consists in updating information and data on regional energy accounts and in drawing up development scenarios and indicators

⁸ Regional *Deliberation* No. 918/99

⁹ Energy saving target, in Civil sector- as concerns only heating equipments - is 140.000 tons of equivalent oil/year in next 10 years, *Regional Energy Plan* in course of approval at present.

2. *Deliberation* implementation, operators training guidelines and certification
3. Support in *putting into effect relevant regional projects*
4. *Regional action programs for sustainable development of regional energy system*. It consists in:
 - developing an assessment methodology of performances concerning regional energy policy – also including public information and agreement - in order to focus and direct future actions;
 - developing a collecting and processing method for regional programs and projects data¹⁰. The method has also to comprehend licences procedures as well as energy and economic performances survey;
 - Designing an appropriate web-site for *Servizio Politiche Energetiche* of Regione.

(Regional Relevant) PROJECTS	Functions and Tasks of Local Authorities	LOCAL AUTHORITY AND FUNDED PROJECT
Fitting urban planning instruments and building regulations to environmental criteria. ¹¹ (PRG, PTCP, Building Code, Urbanization taxes, incentives concerning volume and net surface, maximum costs for cheap buildings, incentives on high efficient techniques and use of renewables)	Fitting planning tools and building regulations to energy-saving principles Programs, Plans and Projects that promote rational use of energy, urban and neighbourhood rehabilitation, distributed production plants, etc.	Modena (Province) Definizione di nuovi strumenti regolamentari per il risparmio energetico e l'uso di fonti rinnovabili
Analysis of new kinds of contracts suitable for Local Authorities to commit public building and to acquire eco-compatible products and services and identification of proper environmental criteria and requirements that works, products, services have to comply with in case of competitions or request for fiscal incentives	Sustainable Criteria for winning contracts in calls for tender; Green-procurement in L.A. Environmental and energy performance requirements in standards, incentives, building licences, administration simple procedures	Bologna (Council) Studio di nuovi sistemi d'appalto per fornitura beni e servizi rilevanti per l'uso razionale dell'energia.
Eco-design and construction of new public buildings, management and maintenance existing ones with high environmental performance and energy efficiency (energy-environmental retrofitting)	Design and construction of new public buildings that adopt new energy-saving techniques and use renewable energy sources.	Modena (Council) Studio di un sistema di certificazione energetico degli edifici di proprietà pubblica o adibiti a uso pubblico
Energy - environmental labels according to international common approaches, European directive 2002/91/EC, experimental rules	Managing and maintaining buildings in order they can comply with minimum energy consumption standards	Bologna (Council) Show room Mostra Educazione energetica e ambientale
Support to Local Authorities for information and orientation of building and plant designers, operators, final users in order to allow them to spread new behaviours of sustainable production, use and maintenance	Compliance control of building activities with energy consumption standards and heating boilers and equipments	Bologna (Council) Show room Mostra Educazione energetica e ambientale
GIS on energy territorial data (heating equipments maintenance intervention, air conditioning systems, for example) Heating systems Cadastral	Collecting all information and creating a data base on regional fleet of heating equipments and equipments in buildings	Rimini (Council) Informatizzazione catasto impianti termici e procedure di controllo degli Enti Locali

Figure 2: **Table showing Regional interest projects funded and implemented by Regione in L.As**

Funding system comprehends:

- Regional Balance financial resources;
- Access to national contributions, like *Carbon Tax*;
- Program agreements and negotiation tools.

¹⁰ art. 84 in Regional Law No. 3/99

¹¹ Some of these actions had already been undertaken years ago by the same Regione in the *Normativa Tecnica Regionale* (Regional Building Technique Law, 1984) and in the *Regolamento Edilizio Tipo* (Prototype for Urban Building Codes of Practice, 2000).

2.3 Table of Technical Comparison and Coordination

The execution of the *Deliberation*, and in particular *Regione's* engagement in DPR 412/93 implementation, is performed through a proper *Tavolo di Confronto e di Coordinamento Tecnico* (Table of Technical Comparison and Coordination)¹², in which all Local Authorities take part (main Councils, Provinces). The *Tavolo di Confronto*:

- checks the development of control of intervention programs carried out by L.A.;
- proposes Communication initiatives addresses to citizen and operators;
- encourages a knowledge system on the trend of *Deliberation* achievements;¹³
- addresses and coordinates training programs;
- prepares prototype contracts that have to be used by responsible ventures and firms;
- identifies criteria and guide-lines to assess energy saving interventions in public housing and to qualify operators;
- promotes meetings and comparison among all organizations and stakeholders involved.

At the *Table*, ENEA also takes part, following a long lasting collaboration with Emilia Romagna Region.

Owing to the Convention with *Regione*, ENEA has the following roles:

- technical-scientific support to relevant project development and Programme Agreement and Contracts drawing up;
- writing intervention programmes for sustainable development of regional energy system;
- arranging tools of assessment of regional energy policies performances, especially concerning general consensus, in order to direct future actions.
- organizing a system of collection and elaboration of data on regional programmes and projects, which comprehends regional and L.A. procedures, assessing economical, environmental and social performances, that is “quantifying” sustainability of regional sector policy;
- technical aid in writing agreements and prototypical contracts between the Region and various services enterprises.

Table already surveyed that, in those territories where boilers tests have been fitted to laws, relevant energy saving was achieved.

In 2000 an appropriate questionnaire on DPR 412/93 already supplied a first set of data.

On this purpose, moreover, the *Table* highlighted:

- the opportunity to create *Local Energy Agencies*, in order to aid and inform citizens, to train operators and designers, to check equipments and energy systems;
- the importance of agreements with workers and users category associations (an *Agreement protocol* among L.A., category associations and users has already been drawn up).
- necessity of collecting all information and creating a date base on regional fleet of heating systems and equipments in buildings and qualitative levels of services for designing, installing, operating, maintaining, and checking. Periodical *Reports* by Councils and Provinces, which will adopt proper GIS Software to bring together building heating systems and other energy information, are going to supply such data.

3. Conclusions

The paper highlighted a complex ‘integrated framework’ of tools and actions, which is to be undertaken by various dimensions and actors of the policy process. As it was mentioned, in fact, it combines local, regional, national and also EU scale.

¹² See Note 4

¹³ Also through an *Annual Report* written by *Regione*.

The scheme could also be extended to other sectors and environmental themes Regions are responsible for. On our opinion, it includes economic, social and environmental issues involving various stakeholders and gives general bases for a sustainable participated process.

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