Journal of Renewable Energy and Sustainable Development (RESD) Volume 3, Issue 2, June 2017 - ISSN 2356-8569
http://dx.doi.org/10.21622/RESD.2017.03.2.183

Energy and the city

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Spatial planning should have a key role in creating urban environments that support less energy-intense lifestyles. A wise consideration of energy in urban land use policies should play an important role considering that, in spite of having a land occupation of 2% and accommodating 50% of the world population, cities produce 80% of GHG emissions and consume 80 % of the world's resources.

In the building industry, the green economy is already part of the designers' approach. This has already produced several energy efficient buildings that also feature high architectural quality. Now is the turn of cities to take the same direction in developing the capacity of formulating sounded urban policies. This will contribute to develop adequate new tools for achieving the energy efficiency goal.

Climate change concern, the dominating environmental paradigm, is permeating the political scenario worldwide, producing a plethora of formal documents. The most recent one is the COP21 agreed in Paris in December 2015, after the failure of the Copenhagen summit in 2009, and formally signed in April 2016 in New York. The challenge for land use planning now is to translate these general commitments into actions that modify planning practices at all levels, from cities to regions.

In this field, the current situation is extremely varied. EU has issued several documents focussed mainly at building level but also sustainable transports are considered a key issue. However, a further step is needed in order to increase the level of integration among all land use approaches, including the idea of green infrastructure as a key component of any human settlement. (European Commission, 2013).

The relationship between urbanisation and climate change has become key worldwide but looking at it from a Mediterranean perspective arises some specificities, considering also the political strain that this part of the world is facing. Both Southern Europe and Middle East and North Africa (MENA) countries will face stronger heat waves in the near future (Fischer and Schär, 2001). Their cities, often poorly planned for decades, will be considerably affected by these temperature upsurges.

A further complexity arises from the fact that the energy approach in land use plans is not direct. Including energy considerations in urban and regional planning is hardly a technological issue. On the contrary, it requires a deep change in the mind-set of urban planners that have to think at the whole city structure wearing the new "energy glasses".

It is possible to trace the energy issue in land use planning back to its history. Spatial planning has a long lasting tradition in defining the shape of urban fabric and the layout of buildings, taking into account the role of the sun and the wind. This tradition has evolved from the seminal experiences of modernist planning to the new sustainable districts, recently developed in several countries like Germany, the Netherlands, France and Sweden, including the ones described by Peter Hall (2014) in his last book.

But Mediterranean countries have an even longer tradition in building cities and houses that were capable of facing hot temperatures, without any of the electric appliances that are consuming now a considerable share of energy. As part of this long-established tradition, it is worth remembering the inspiring contribution of the Egyptian architect Hassan Fathy. Looking back at the city history is not a mere exercise based on nostalgia. Making greener Mediterranean cities, as they were up to a recent past, is a complex task but it will become unavoidable in order to guarantee forms of sustainable cooling.

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This is especially true in those cities that have grown considerably in the second half of the 20th century, according to high-density models.

Urban planning has been also concerned with defining the proper mix of land uses, taking into account the key role of transports. Compact and walkable cites, rich of activities, are naturally energy efficient. The lesson taught by Jane Jacobs in her seminal book *Death and Life of Great American Cities* remains relevant also assuming the energy approach. More recently, emerging planning themes are including the containment and retrofitting of urban sprawl by integrating transport and land use planning. Applying Transit Oriented Development (Tod) principles can induce a change in mobility choices of inhabitants of this unsustainable form of urban settlement, by giving them more mobility opportunities.

Land use planning will also play a relevant role in accommodating new forms of distributed sustainable energy production in the urban fabric. The recent 2015 Snapshot of Global Photovoltaic Markets, by the International Energy Agency, confirms that economic incentives, like feed-in tariffs, are not enough to guarantee a stable diffusion of this type of energy production. After the phasing out of this incentives there diffusion of PV, reduces considerably. This is case of Italy that installed only 300 MW of PV systems in 2014, compared to 9,3 GW in 2011, 3,6 GW in 2012 and 1,6 GW in 2013. Integrating energy production in the city as part of urban design will increase the opportunity of making sustainable energy production an inherent feature of the city design, including energy production devices in the city realm and using them for retrofitting poor quality buildings.

In addition, planning tools have to incorporate incentives aimed at favouring higher energy standards, both for new and existing buildings. The costs of these actions should be covered by planning normative tools. Several techniques, like the Carbon Offset Fund in Great Britain, have been tested but there is a great need of new research in this field, at national and local level, since these tools are not easy to implement without taking into account site-specific norms and approaches. In addition, the exclusive use of the market leverage risks to confine these tools to wealthy communities, excluding the poor ones.

These new attitudes require not only new planning tools but also a great capacity of devising urban policies capable of involving communities with different cultural backgrounds and planning traditions. A wise mixture of tradition and innovation is central to innovate the urban planning discipline in the direction of sustainability. A lot of *mental energy* has to be devoted to the difficult but stimulating objective of improving the energy awareness of our cities.

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Associate Professor in Town and Regional Planning at the University of Catania, School of Architecture, since October 2005, Deputy President of the School of Architecture. He has been Faculty Coordinator of the PhD Program in "Environmental Planning and Design" at University of Catania. In 1987 he graduated in Civil Engineering at the University of Catania. He received his PhD in Urban and Regional planning in 1998. He attended courses at INSEAD, Fontainebleau, and at University of Surrey. His main fields of interests includes regional and landscape planning, management issues related to land use, the use of GIS and planning of industrial estates. He has been part of research teams of several plans and research programs including the following: Land Use Master Plan of Catania, Landscape protection Plan in Sicily, GRaBS (Green and Blue Space Adaptation for Urban Areas and Eco Towns, a program funded by EU - INTERREG IVC), SPECIAL (Spatial Planning and Energy for Communities in All Landscapes, a project funded by Intelligent Energy Europe). He is author co-author and editor of over 80 publications (books, book chapters and research papers).