

Systemic Approach for the Integration of Energy and Climate Planning in Urban Management

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Abstract. The voluntary-based initiative Covenant of Mayors (CoM) by 2016, through the Sustainable Energy and Climate Action Plans (SECAPs) has focused on the active role of local authorities and increased its targets in terms of GHG reduction from 20% to 40% by 2030. Considering SECAP as an urban planning tool, it can improve the resilience of the EU Municipalities to climate-change, developing adaptation/mitigation actions and increasing the "environmental awareness" of the involved actors. From a planning perspective, the CoM started a new season of urban planning in Europe covering the planning demand in the domain of implementing sustainable territorial development objectives. However, we may affirm that the SECAP is based on a sectorial approach, and it misses an integrated urban vision that represents a pre-requisite for an effective urban planning practice. Thus, in this research we suggest a methodological proposal to exploit this widespread of SECAPs among EU, including the systemic strategic planning approach in the process of SECAP design and ensuring an integrated vision of city development over the list of actions per sectors required by Global CoM procedures.

Keywords: Energy planning · SECAP · Covenant of mayors · Urban planning · Climate-change · European climate policies

1 Introduction

The Covenant of Mayors (CoM) in June 2016 increased its targets in terms of greenhouse gases (GHG) reduction from 20% to 40% by 2030 and adopted an integrated approach: energy and climate change mitigation/adaptation. It was the result of the join with another city initiative, the Compact of Mayors which is an agreement among city networks to support the reduction of city-level emissions and to reduce vulnerability to climate change by developing resilient cities [1–3].

Indeed, the Compact of Mayors is an agreement between city networks aimed to:

- undertake a supportive approach to reduce city-level emissions,
- reduce vulnerability and to enhance resilience to climate change, in a consistent and complimentary manner with respect to national level climate protection efforts.

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The Compact of Mayors builds on the ongoing efforts of the mayors that represents a city administration and may agree to such a commitment that increasingly sets ambitious, voluntary city climate commitments or targets for greenhouse gas (GHG) emission reduction and to address climate risk. They report on progress towards achieving those targets by meeting robust, rigorous and consistent reporting standards (as established through City Networks); and make that information publicly available by reporting through a recognized city platform, such as carbon Cities Climate Registry, CDP Cities.

The resulting "Global Covenant of Mayors for Climate and Energy" (G-CoM) represents the second implementation phase after the first phase (2008–2020) focused mainly to the energy efficiency and CO_2 emission reduction. Currently the G-CoM is the largest movement of local governments committed towards going beyond their own national climate and energy objectives and it is fully in line with the UN Sustainable Development Goals [4]. Every Signatory of G-CoM in the first phase developed a Sustainable Energy Action Plan (SEAP) while in the second phase upgraded the SEAPs to Sustainable Energy and Climate Action Plans, coupling the energy efficiency and the climate adaptation/mitigation actions. The Fig. 1 shows the energy and climate components that build the SECAP structure.

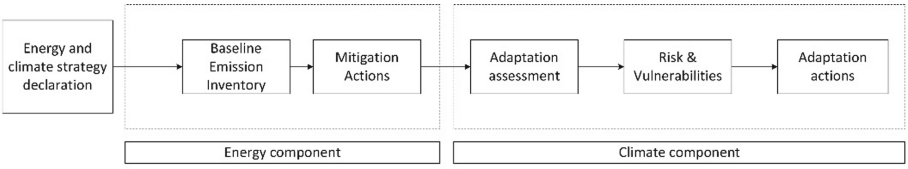

Fig. 1. The SECAP structure

SEAPs and SECAPs started a new season of urban and territorial planning in Europe according to a volunteer approach in developing planning tools out of any normative obligation deriving from any planning law (national/regional). In the perspective of the authors, these urban planning tools enriched the institutional planning framework through: effective practices, useful technical contributions in selecting intervention priorities, design of feasible project frameworks for public and private investments (also promoting EU Cohesion Policies by Regional Operational Programs). Indeed, SECAP has to be considered an urban planning tool, because climate adaptation planning *"is well suited to local levels of governments, as citizens can participate in creating targeted adaptation strategies that address the important regional impacts, and these strategies will provide tangible benefits to local residents"* [5].

Starting from recent researches [6–10] it has been highlighted a generalized success of the G-CoM policy both in terms of an effective contribution towards achieving the UE 2020 emission targets and in terms of commitment of local administrations and local communities towards EU policies objectives.

After a critical analysis of the SECAP methodological approach (in Sect. 2) that identifies the strengths and weaknesses of the G-CoM in terms of process rationality,

Sect. 3 provides a methodological proposal aimed at overcoming the SECAP sectorial approach towards a cross-system approach. Section 4 is related to the conclusions, highlighting the main results of this research.

2 The Strictly Sectorial Approach of SECAP

Experiences from European CoM Municipalities [11–16], reported a sectorial approach in the SECAP design process as a distinctive feature of it. This distinctive feature in our point of view, represents the main weakness of the SECAP approach, separating urban components such as transport, environment, energy, water management etc., without offering any integration between actions that covering multiple sectors. SECAP official Guidebook [17] requires to every CoM Signatory "*A cross-sector and holistic territorial approach*", but finally SECAP lists a number of actions, divided in sectors and without any assessment of the potential integration in terms of benefit in multiple sectors. Thus, we can affirm that the SECAP is based on a sectorial approach, and it lacks an integrated urban vision that represents a prerequisite for an effective urban planning practice. SECAP design is basically build on the development of actions according to a pre-defined standard set of sectors, preferring the implementation of specific actions related to sectors in a one-on-one relation and neglecting the possible impacts of the single actions (positive or negative) on the whole urban system. However, the flexibility of the SECAP approach intended as a decision-making process, compared to other institutional planning processes could fill the gap of traditional urban planning tools concerning the objectives of GHG reduction and climate adaptation/mitigation. In the perspective of the authors, cities should be considered as a set of systems (such as green spaces, waterproofed soils, energy system [18], active mobility [19] (Scorza and Fortunato, in print)etc.) where the implemented actions could affect several systems, according to an integrated urban vision. In the following section, is suggested a methodological proposal oriented towards a systemic approach to integrate the SECAP sectors through an integrated urban vision based on a cross-sectorial assessment of effects of selected actions.

3 A Methodological Proposal for SECAP: The Cross-System Assessment

Every CoM Signatory compiles a SECAP worksheet composed of the following parts: energy and climate strategy declaration, emission inventories, mitigation actions, risks and vulnerability and adaptation actions. Thus, the SECAP process design seems to be only a check between the proposed actions and the SECAP sectors, appearing as a weak process from a territorial point of view. Furthermore, it does not highlight the relations between actions and territorial context and facilitate the forward monitoring phase. The planning knowledge happens per territorial systems (i.e. mapping activities, data collections, spatial analysis) while SECAP approach organizes the plan in standard sectors that are subsets of the planning systems. Thus, is necessary to structure the relations between planning systems and SECAP sectors, reminding that those relations are strictly bounded to the local context characteristics. The methodological proposal of the authors is based on four steps:

1. Knowledge of the city based on its natural and artificial components such as water, soil, air, waterproofed soils or infrastructures. This first step allows to evaluate suitable areas for interventions looking to multiple critical issues (natural or not). Results of this step are Suitability Maps (SM), that support the process of defining territorial objectives and actions (mitigation, adaptation or other).
2. Starting from the SM, it can be defining the overall territorial objectives and typologies of actions which represent homogeneous groups of interventions related to the territorial objective.
3. On every SM the "territorial target" has to be identified, i.e. real elements of the city on which the planned actions are implemented. These territorial targets need to joined to a set of objectively verifiable indicators in order to measure, over time, the results obtained.
4. Defining the adaptation actions for territorial targets. Each action specifies intervention typology, territorial target and accountability variables of the design (budget, timeframe, stakeholders, etc.). These actions identified by the methodological proposal, will be included and detailed in the SECAP sections: "Mitigation Actions" and "Adaptation Actions".

Steps 1 and 2 represent the core of the whole proposal, because they support the decision-making process, establishing objectives and intervention priorities on the areas afflicted by the highest vulnerability (natural or not). The knowledge of the city happens through the Main Urban Systems (MUS), allowing to achieve a comprehensive vision of the city where the relations among different systems are clear and easier to understand. This aspect is the breakthrough, and let to overcame the sectorial SECAP approach towards a vision by systems.

In step 3 have been added innovative elements to the SECAP methodology: the "territorial targets". They are real elements or parts of the city that are recognizable into the MUS, on which it is possible to fit the actions. The usefulness of the "territorial targets" is further explicit considering the relation between the territorial dimension [20–24] and SECAP interventions.

Step 4 is the "conservative" step of the proposal. Indeed, the proposal is oriented to reinforcing the SECAP approach with the urban planning discipline principles (systemic approach), instead to dismantle nor replace it.

At last, the "territorial targets" are oriented to improve the achievement of an integrated urban vision.

Relations between SEAP sectors and systems identified for the case study Potenza Municipality deriving from previous researches [25–30] are presented in Fig. 2.

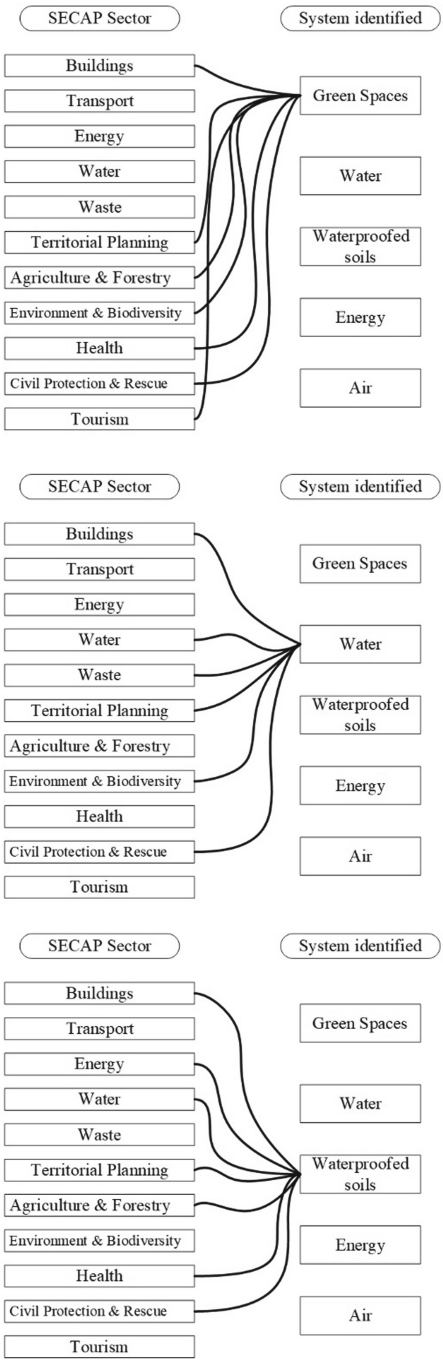

Fig. 2. Relations between SEAP sectors and systems identified

4 Conclusions

The CoM has opened a new season of urban and territorial planning in Europe, according to a voluntary approach and out of any normative obligations or planning law. This is the demonstration of the increasing planning demand oriented to the sustainable territorial development objectives [3, 4, 31, 32].

The introduction of "territorial target" represents an innovative element to explain the "spatialization" of the SECAP interventions provided.

Data availability still remains a weakness for assessing territorial policies [33, 34] but CoM database shows that among the Signatories (at April 2021) the 67,38% of the whole CoM Municipalities are "small" Municipalities (i.e. under 10000 inhabitants)., that look to SECAP as tool facing the climate-change. These are eligible case studies where apply the methodological proposal, in a promising perspective.

These "small" Municipalities could be the specific context where design better and implement strategies and actions related to the application of the methodological proposal. On this track, the methodological proposal highlights new scenarios of territorial planning: coupling the climate challenges with the energy efficiency. Among the forthcoming generation of planning tools, the SECAP could be a favourite candidate for the EU Municipalities [35].

An interesting component for further developments of this research is the engagement of stakeholders and the involvement of the citizens through participation methods such as public consultation, working groups, forums, workshops [36–39].

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