Monitoring SEAPs: Mismatching in Italian Implementation of Sustainable Energy Planning

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Abstract. European climate policy, since the 1990s, has developed incrementally and supported programs, plans and actions for sustainable, clean and secure energy. The Covenant of Mayors (CoM), a volunteer movement of local administrators established in 2008, set a target of a 20% reduction in CO_2 emissions by 2020. The CoM has launched a new season on energy planning in Europe based on Sustainable Energy Action Plans (SEAPs), defining actions for selected intervention sectors. The aim of the work was to evaluate after the 2020 deadline, the state of the implementation of Italian CoM signatories, assessing results achieved in terms of the Municipalities involved (CoM signatories), SEAPs developed and Monitoring Reports submitted. Specifically, the analysis of the Monitoring Reports data represents a relevant step needed in order to formulate some critical appraisals concerning the performance level of CoM adoption at a national scale, in terms of the commitment levels, goals achieved and actions completed or in progress. The paper also remarks the recurring issue of mismatching between Italian SEAPs submitted and their Monitoring Reports. This critical step is not allowed to know the real number of CoM Signatories on track or not with their commitments. Therefore, a realistic framework of Monitoring Reports represents a useful tool for interpreting the targets achieved in terms of CO_2 reduction and for improving the current Global Covenant of Mayors for Climate and Energy (GCoM) adoption procedures.

Keywords: SEAP · Covenant of mayors · Energy plans · Voluntary-based planning · European policies · CO_2 emission reduction

1 Introduction

The Covenant of Mayors (CoM) was launched in 2008 in Europe fostering the ambition to gather local governments voluntarily and committed to achieving and exceeding the EU climate and energy targets [1]. In October 2015, the new Covenant of Mayors for Climate & Energy was launched. Its goals were defined with cities through a consultation

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process and are ambitious and broad-ranging: signatory cities are now commit to actively supporting the implementation of the EU 40% GHG-reduction target by 2030 and agree to adopt an integrated approach to climate change mitigation and adaptation and ensure access to secure, sustainable and affordable energy for all. In the same year, the EU signed the Paris Agreements [2]. This global strategy integrates energy and climate policies including the so-called 20/20/20 targets [3], namely the reduction of carbon dioxide (CO_2) emissions by 20%, the increase of the market share of renewable energy to 20%, and a 20% increase in energy efficiency. In June 2016, the Covenant of Mayors entered a relevant new phase of its history joining with another city initiative, the Compact of Mayors.

The resulting "Global Covenant of Mayors for Climate and Energy" (GCoM) is currently the largest movement of local governments committed to going beyond their own national climate and energy objectives.

With an annual emissions reduction expected to reach 4.2 billion tons of CO_2eq in 2050, GCoM cities are showcasing the massive urban opportunity that national governments can harness to accelerate action and progress towards the Paris Agreement goals – simultaneously safeguarding the health and prosperity of their citizens. Fully in line with the UN Sustainable Development Goals such as affordable and clean energy, climate action and sustainable cities/communities [4, 5], the GCoM will tackle three key issues:

- climate change mitigation,
- adaptation to the adverse effects of climate change,
- universal access to secure, clean and affordable energy.

In May 2021 the Covenant of Mayors for Europe counted 10628 Signatories but only 7551 Signatories adopted a Sustainable Energy Action Plan (SEAP). All Signatories are able to develop a Sustainable Energy and Climate Action Plan (SECAP) with new ambitious goals: the EU 40% greenhouse gas-reduction target by 2030 and the adoption of a joint approach to tackling mitigation and adaptation to climate change [6, 7]. The research focuses on the Italian SEAPs looking to the implementation of the monitoring reports, often considered a quantitative step and not an evaluation of performance reached by the SEAP processes supporting the smart city planning [8–10].

The research in Sect. 2 explains some interesting features of the Italian SEAP MR from CoM website database while the Sect. 3 tackles the theme of the mismatching between SEAPs and Monitoring Reports. The conclusions in Sect. 4 highlight the main outcomes and future perspectives of the research.

2 Features from Italian SEAP Monitoring Reports

The official CoM website offers a database where have been collected Signatories and their SEAPs classified by various features as Commitment or Country. Thus, using as filter the commitment "2020" and Italy as "Country", 3224 Italian Signatories have been found with a submitted SEAP. After the deadline of 2020 (the first period of commitment), the work explores how the Municipalities have progressed through their

planned interventions, analyzing the SEAP sectors covered and the overall CO_2 emission reduction target. This step also allows to know Signatories working on their SEAPs, that develop and implement them. In 2021, the Monitoring Reports (MRs) submitted to CoM database are 1030 compared to 3224 SEAPs, only the 32% of the whole SEAPs submitted. Analyzing the MRs, we calculated the occurrences of the SEAP sectors (industry, local electricity production, local heat/cold production, municipal buildings, equipment/facilities, public lighting, residential buildings, tertiary buildings, equipment/facilities, transport, and others). In Table 1 are suggested the occurrences of the SEAP sectors and the related percentage on total MRs.

Table 1. Occurrences of the SEAP's sectors among the Monitoring Reports submitted

SEAP Sector	Occurrence of sector on total MRs	Percentage of sector on total MRs
Agriculture	7	1%
Industry	298	29%
Local electricity production	921	89%
Local heat cold production	448	43%
Municipal buildings equipment facilities	949	92%
Others	802	78%
Public lighting	933	91%
Residential buildings	944	92%
Tertiary buildings equipment facilities	671	65%
Transport	946	92%

Another relevant data is related to the overall CO_2 emission reduction target, sets at the beginning to 20% (according to 20/20/20 target) and then upgraded to higher percentage. Among the 1030 MRs the range 20–25% of the overall CO_2 emission reduction target (see Table 2) gathers 796 Signatories (i.e. 77%), while only 233 have moved toward more ambitious targets over 25%.

Significant differences between SEAPs and MRs in terms of occurrences of sectors mean that in the implementation phase, occurred many changes in the overall strategy [11]. This can reflect a double perspective:

- the flexibility of the SEAP as an urban development program in adapting the implementation based on local issues that emerge in a specific implementation sector [12–15];

Table 2. Number of MRs per overall CO_2 emission reduction target

Overall CO_2 emission reduction target set	Number of MRs	Overall CO_2 emission reduction target set	Number of MRs
20%	295	29%	16
21%	182	30%	26
22%	115	0,31%–0,40%	52
23%	77	>40%	54
24%	61		
25%	66		
26%	39		
27%	28		
28%	18		

- a lack of robustness of the ex-ante evaluation and planning phases [13], based mainly on the BEI assessment and targets but not considering the relationship of such a framework with the contextual feasibility of the envisaged actions

From a spatial point of view, the geographical distribution of the MRs is suggested in Fig. 1, while in Table 3 have been counted the MRs currently available on CoM database divided per NUTS1 areas. NUTS1 classification subdivides Italy in 5 areas:

ITC - NORTH-WEST
ITH - NORTH-EAST
ITI - CENTRE (IT)
ITF - SOUTH
ITG – ISLANDS

Data from Table 3 compared to data of previous research [11], shows that among CoM Signatories only in ITC-NUTS1 Area there was a low process of implementation of SEAPs submitted. In the other NUTS1 Areas the high number of SEAP submitted (i.e. ITG NUTS1 Area with 472 SEAPs submitted on 767 Municipalities) have not followed by the same percentage in term of MRs.

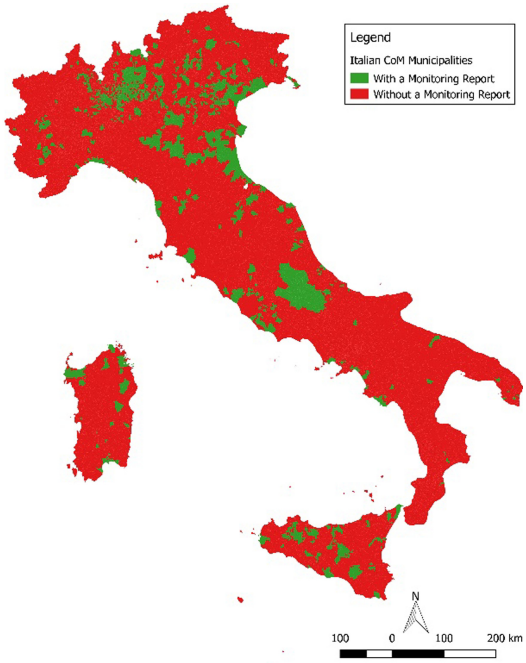

Fig. 1. Italian CoM Municipalities with or without a MR submitted

Table 3. Monitoring Reports classified per NUTS1 Areas

2016 NUTS1	Number of Monitoring Reports [No.]	Percentage on total MRs [%]
ITC	524	50
ITH	239	23
ITI	63	6
ITF	155	15
ITG	71	7

3 The Mismatching of Implementation Between SEAPs Submitted and Monitoring Reports

The implementation of SEAPs submitted with MRs is a critical step that allows to known how much progress has been achieved in term of CO_2 emissions reduction set. Thus, the Municipalities develop their MRs, but often the lack of support to the Municipalities uploading data on the CoM website forces them to do not upgrade data. This is the case of the Italian Basilicata Region, where among 84 SEAPs submitted by Municipalities on official CoM website, only one has the MR uploaded. It is not the true reality, considering that other Municipalities such as Melfi, Castelsaraceno or the Basilicata regional capital Potenza, have developed their MRs but have not uploaded them on CoM official website.

Another critical issue regards the changes in the institutional structures: in the last decade a lot of Municipalities were born from the joining of two or more small Municipalities. In this perspective, some Municipalities that submitted a SEAP as only-one, in the MRs are signed as the new Municipality born. This is a recurrent condition of many Italian Northern Municipalities, where among CoM Signatories 44 Municipalities from 2016 have become 9. The majority of them have signed up as single one as SEAP, while in MRs as new Municipality. Furthermore, the CoM classification does not take into account the fact that the population size of the signatories in Italy could refer either to a single municipality or to a group of Municipalities. This is the case for unions/associations of small Municipalities with populations under 5000 inhabitants, called "piccoli comuni" by the National Association of Italian Municipalities. This represents a discrepancy between the number of signatories on the CoM website and the actual number of Municipalities that are committed to the SEAP implementation: we have a number of Municipalities committed in the CoM implementation larger than the number of the submitted SEAPs. In the Italian case, we have 3299 CoM signatories, which include 104 unions/associations of Municipalities. The Municipalities included in those 104 unions/associations comprise 706 small Municipalities (representing 21% of the total CoM signatories). Among them, an example could be the "Comunità Montana Valle Sabbia" a mountain community built up by 25 Municipalities, that in term of SEAP Signatories is only-one. This last remark is a positive side of the mismatching: the real number of the CoM Signatories is higher than the official data on CoM website. The negative side of the mismatching is related to the lack of the MRs developed by the Municipalities but not uploaded on the CoM website, this represents basically the field where analyze the progresses achieved and build furthermore considerations or scenarios.

4 A Comforting Vision for the Future?

Mismatching at least can return a comforting vision of the CoM experience among the European Municipalities, considering the real widespread of Signatories. Indeed, the success of the CoM experience should be seen from the perspective of the engagement of the Municipalities and not only in term of Signatories count but mainly as an engagement process supported by effective participatory framework [18, 19]. This point of view changes the vision of the MR considered until now as a necessary step to continue the pathway of the SEAP process. Clearly, the MRs are basically tools to manage and perform the SEAPs, and through a step-by-step process go to the direction of the Sustainable Energy and Climate Action Plans (SECAPs), coupling the CO_2 reduction with the climate adaptation/mitigation actions [20]. Notwithstanding this positive aspect of the mismatching some critical issues remain unsolved:

1. The lack of technical support to the Municipalities during the uploading process to CoM official website of the MRs developed. This may affect the effectiveness of the entire process of CoM implementation at a local level;
2. The missing evaluation of the performance and the results in term of CO_2 reduction achieved by the interventions provided in the SEAP where the MRs have not developed,

3. The opportunity of increase the number of citizens and stakeholders engaged in the SEAP processes through the MRs in order to support the improvement of the environmental sustainability and quality of life [16, 21]

These issues are eligible topic of future developments, considering the fact that MRs represent a key component from a planning point of view. Additionally, profitable perspective for SECAP implementation goes in the direction to achieve effective green infrastructure planning [22, 23], reducing land take and urban sprawl [24–28]. Another critical domain regards urban mobility [29, 30] considered a support to improve urban quality [31]. MRs and SEAPs are tools that started a new season of urban and territorial planning in Europe according to a volunteer approach in developing planning tools [16, 32]. This is representative of the high planning demand in the domain of implementing sustainable territorial development objectives [4, 6, 33, 34]. At the same time, it is a measure of the unsuitability of the current normative framework concerning urban development and management to express required performances in promoting actions and tools (the "plans"), oriented towards applying sustainable development principles and climate adaptation/mitigation.

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