

# WP T4 Replication and Knowledge Transfer

## Activity A.T 4.2

### D.T4.2.2 Recommendations on clean energy in winter tourism territories

Project acronym: Smart Altitude  
 Project name: **Alpine winter tourism territories demonstrating an integrated framework for a low-carbon, high-impact and resilient future**  
 Programme priority: **Priority 2 - Low Carbon Alpine Space**  
 Programme specific objective: **SO2.1 - Establish transnationally integrated low carbon policy instruments**

<b>Document: Internal</b>			
<b>Responsible partner: Les Orres/EDF, with support from UMIL</b>			
<b>Involved partners: All</b>			
Version	Status	Date	Author
0.0	Structure of report	11/11/2020	UMIL
1.0	Report Draft	28/12/2021	Les Orres/EDF
2.0	Revision and PP contributions	15/03/2021	All PP
3.0	Final version	31/03/2021	Les Orres
<b>Notes:</b>			

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## 1. Executive summary

The Smart Altitude project has enabled the development of proven tools for the implementation of mitigation and adaptation measures for mountain territories, in particular mountain resorts and their associated communities, to the challenges posed by climate change. Thanks to the development of a clear, pragmatic and detailed process, the project has shown its capacity to widen its spectrum of action by enlisting other resorts and territories in a common approach to energy efficiency and reduction of the carbon footprint of mountain resorts. By linking these tools and results with initiatives and their implementation such as the Covenant of Mayors and the SECAPs action programmes, as well as the strategic approach of EUSALP, in particular through its action groups 1 and 9, Smart Altitude demonstrates the interest in continuing the process underway, in a form yet to be defined and in full synergy with existing programmes, in order to build an efficient and sustainable future for mountain territories with a high tourism intensity.

## 2. Introduction:

Low-carbon policy implementation in winter tourism territories is adversely affected by local economies that are seasonal and highly sensitive to climate conditions. Tourism represents 10 to 15% of the labour market and EUR 50 billion turnover/year in the Alps, and require climate change adaptation & mitigation strategies. This paradox can be broken down in 4 intertwined challenges: (i) obstacles to low-carbon investments in winter tourism, requiring new economic models; (ii) territorial inhomogeneity and uneven mountain development trends; (iii) different governance models between public and private stakeholders in infrastructure management; (iv) hurdles in valuing the replication potential of low-carbon solutions in the winter tourism industry.

This results in difficulties in implementing adaptation strategies that are inclusive (territory-level rather than scattered among operators), proactive and reinforcing territorial attractiveness over the long term. The project proposes to overcome differences in territorial governance and infrastructure management models to develop a common, transnational approach to clean energy policy implementation in mountain territories. It will enable shared climate ambitions to be delivered by all stakeholders (public authorities, users, operators, investors, knowledge centres etc.) with sufficient openness to allow coordination, synergies and significant impact on adaptation and mitigation measures.

Previous projects have built the case for low-carbon solutions and strategies (ALPSTAR, CESBA, RECHARGE.GREEN, ClimAlpTour...). Building on these solutions, this innovative approach tackles economic and governance hurdles that are key to mountain territories. SMART ALTITUDE proposes a common approach to identify potentials, address obstacles and make operations investible. It will be based on 4 living labs serving as demonstrators for good practices: Krvavec (Slovenia), Madonna di Campiglio (Italie); Verbier (Switzerland); Les Orres (France), providing real-time feedback. Based on these good practices, a detailed toolkit and formal replication process have been set up to enroll at least 20 other resorts in the Smart Altitude approach. At the end of the project, 26 resorts (including the 4 living labs) are involved in the Smart Altitude approach of climate adaptation and mitigation for Alpine resorts. In addition, several reports have been issued addressing recommendations directed to decision makers at the regional, national and European level.

The present report examines more specifically how the Smart Altitude project can help implement SECAPs programs and other actions linked to initiatives and institutions such as the Covenant of Mayors. It will first draw a quick overview of Climate adaptation and mitigation measures at the Alpine

<https://www.alpine-space.eu/projects/smart-altitude/en/home>

level, then review the Smart Altitude project results and toolkit and their adequation to the Covenant of Mayor SECAP programs.

### 3. Alpine local authorities to adapt to climate change and specific challenges of mountain touristic destination

For more detailed information on this introductory topic, we refer the reader to 3 Smart Altitude Reports: Territorial Maximization Report<sup>1</sup>, Recommendations on S3, entrepreneurship and innovation support<sup>2</sup>, and Replication roadmap<sup>3</sup>. You will find below a quick summary of the main findings of these reports.

On the European territory, mountain resorts are present in about 600 municipalities spread over 22 NUTS2 regions and 90 NUTS3 regions. Tourism represents 10 to 15% of the labour market and EUR 50 billion turnover/year in the Alps. European mountainous areas are characterised by a relatively low level of industrialisation and a particularly important weight of winter tourism, fed by the large regional, national, and international conurbations, in the balance of its local economy. As a consequence, mountain communities can be highly dependent on tourism activity, which brings financial resources and seasonal employment.

The climate change already impacts winter tourism regions negatively and this trend is expected to increase. Indeed, in its Special Report on the Ocean and Cryosphere<sup>4</sup> (2019), the Intergovernmental Panel on Climate Change (IPCC) observes that “in nearly all high mountain areas, the depth, extent and duration of snow cover have declined over recent decades, especially at lower elevation”. Consequently, the report also observes that “tourism and recreation, including ski and glacier tourism, hiking, and mountaineering, have also been negatively impacted in many mountain regions”. The report further predicts that “current snowmaking technologies are projected to be less effective in reducing risks to ski tourism in a warmer climate in most parts of Europe”.

In terms of economic and market impacts, a critical review of 119 academic publications carried out in 2019<sup>5</sup>, that examined the climate change risk on ski tourism in 27 countries, highlighted the following general pattern: decreased reliability of ski slopes on natural snow, increased snowmaking requirements, shortened and more variable ski seasons, a contraction in the number of operating ski areas, altered competitiveness among and within regional ski markets, implications for ski tourism employment, change in real estate values. Extent and timing of these consequences depend on the rate of climate change and the types of adaptive responses by skiers as well as ski tourism destinations and their competitors.

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<sup>1</sup> <https://www.alpine-space.eu/projects/smart-altitude/results/wpt3/d.t3.2.1.pdf>

<sup>2</sup> [https://www.alpine-space.eu/projects/smart-altitude/results/wpt4/smart-altitude\\_d4.2.3\\_v1.3.pdf](https://www.alpine-space.eu/projects/smart-altitude/results/wpt4/smart-altitude_d4.2.3_v1.3.pdf)

<sup>3</sup> [https://www.alpine-space.eu/projects/smart-altitude/results/wpt4/smart-altitude\\_d4-2-1-replication-roadmap.pdf](https://www.alpine-space.eu/projects/smart-altitude/results/wpt4/smart-altitude_d4-2-1-replication-roadmap.pdf)

<sup>4</sup> <https://www.ipcc.ch/srocc/>

<sup>5</sup> Steiger, Scott, Abegg, Pons, & Aall, Current issues in Tourism, 22:11, 2019.  
<https://www.tandfonline.com/doi/full/10.1080/13683500.2017.1410110>

Therefore, it is of the utmost importance to protect the local permanent population from the economic risks of reduced resort activity due to climate change. This threat is also an opportunity to reconsider the economic model of mountain areas, i.e., to favour the decoupling of financial flows from tourism by developing full-time jobs and year-round activities, for instance through environmentally friendly summer activities, local green-energy initiatives, short cycle farming and new services for the local population. The future resides in helping the local populations to manage and take charge of the sustainable development of their community and territory.

The European Commission (EC) refers to adaptation as “anticipating the adverse effects of climate change and taking appropriate action to prevent or minimise the damage they can cause or taking advantage of opportunities that may arise”. EC points out that adaptation strategies are needed at all levels of administration, from local to the international level; however, “due to the varying severity and nature of climate impacts between regions in Europe, most adaptation initiatives will be taken at the regional or local levels” (EU Commission official Website).

the key initiatives at the European and transnational level are the following:

- **The EU Strategy for the Alpine Region (EUSALP)** <sup>6</sup>, a joint initiative of Alpine states and regions to strengthen cooperation and to address common challenges in a more effective way; it includes within its objectives the establishment of a multi-level governance framework and transnational policies to enhance climate mitigation and adaptation among the Region’s countries.
- **The EU Adaptation Strategy** <sup>7</sup>, adopted by the European Commission in 2013. This focuses on delivering an effective and coordinated approach in order to render the EU Member States more resilient to climate change, at all levels of governance. This is expected to be achieved by supporting EU States, Regions and cities in the adoption of adaptation strategies; by promoting adaptation actions in specific and more vulnerable fields such as agriculture and infrastructures; and by enhancing communication and information about climate adaptation in the decision-making context.
- Regarding **climate mitigation**, the European Union set an ambitious target to become the first climate-neutral continent by 2050, and it is already on track regarding the achievement of 2020 and 2030’s objectives <sup>8 9</sup>. To pursue the aim of substantially reducing greenhouse gas emissions, investing in a sustainable and circular economy system, preserving the European environment and biodiversity, the main measures implemented are the **European Green Deal** with the **proposal of European Climate Law and European Climate Pact initiatives** <sup>10</sup>.

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<sup>6</sup> EUSALP initiative: <http://alpine-region.eu/>

<sup>7</sup> EU Adaptation strategy: [https://ec.europa.eu/clima/policies/adaptation/what\\_en](https://ec.europa.eu/clima/policies/adaptation/what_en)

<sup>8</sup> [https://ec.europa.eu/clima/policies/strategies\\_en](https://ec.europa.eu/clima/policies/strategies_en)

<sup>9</sup> [https://ec.europa.eu/clima/policies/eu-climate-action\\_en](https://ec.europa.eu/clima/policies/eu-climate-action_en)

<sup>10</sup> [https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal\\_en](https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en)

## 4. Project results and toolkits

### Smart Altitude project main Results

The Smart Altitude project main operative results consist in the Smart Altitude decision-making tree<sup>11</sup>, in the Smart Altitude toolkit, of which technologies deployed in the four living labs are detailed in the Territorial maximization report<sup>12</sup>, and finally in the Smart Altitude Replication process, exposed in the Replication Roadmap report.<sup>13</sup>

All available technologies are described in full and compared in the Territorial maximization report. Below is a short summary of the actions deployed in the four living labs. Table 1 below lists the main measures to be taken in ski resorts.

<b>Overall ski resort</b>	<b>Monitoring and Integrated Energy Management System (IEMS)</b>
<b>Ski lifting</b>	Monitor and implement an EMS
	Assess ski lifts energy efficiency
	Implement heat recovery
	Implement renewable energy sources (e.g. PV)
	Implement speed control measures (e.g. based on the number of entrances)
<b>Snow making</b>	Optimal water management (flow rates, height differences, main and secondary reservoirs, water concessions)
	Through the analysis of the pumps for the distribution of water and their working points, interesting ideas can be found for the reduction of unnecessary oversize, operation outside the optimum range, replacement of inefficient pumps
	Replace old snow-making systems with modern technology
	Implement an automated snow making system
	Plan which kind of snow making system is the most effective for the ski resort (Fan gun, Hybrid/tower, Hybrid/high-pressure)
	Implement renewable energy sources

<sup>11</sup> [https://www.alpine-space.eu/projects/smart-altitude/results/wpt3/smartaltitude\\_dt311\\_decision\\_making\\_tree\\_v04\\_final.pdf](https://www.alpine-space.eu/projects/smart-altitude/results/wpt3/smartaltitude_dt311_decision_making_tree_v04_final.pdf)

<sup>12</sup> <https://www.alpine-space.eu/projects/smart-altitude/results/wpt3/d.t3.2.1.pdf>

<sup>13</sup> [https://www.alpine-space.eu/projects/smart-altitude/results/wpt4/smart-altitude\\_d4-2-1-replication-roadmap.pdf](https://www.alpine-space.eu/projects/smart-altitude/results/wpt4/smart-altitude_d4-2-1-replication-roadmap.pdf)

Snow grooming	Verification of the systems available for the management of the snow groomers' park and for the management of the snow groomers' routes. The advantages are several: <ul style="list-style-type: none"> <li>• reduction of maintenance costs;</li> <li>• reduction of fuel consumption through the optimization of routes;</li> <li>• control of the work on the slopes (thickness of the snow);</li> <li>• online monitoring of the machines (e.g. position, speed, with advantages for safety and consumption)</li> </ul>
	Replace old grooming machines with newer ones
	Implement hybrid/electric snow groomers
Buildings	Assess the energy consumption of the ski resorts building and improve the heating system and ventilation
	Replace indoor and outdoor lighting with energy-efficient lightbulbs and an automated lighting control
	Improve the energy efficiency of building envelopes
	Implement renewable energy sources for heating and electricity

Table 1 – Possible climate-change mitigation measures for ski resorts

Table 2 presents the main results of the actions in the four living labs. Some of them are still under investigation because several seasons are necessary to measure the effects of actions implemented.

Action	Application field	Living labs deployment	Consumption reduction
Energy optimization	Tourism accomodation	Krvavec Les Orres	20% oil 20%-30% electric power
	Snow production	Krvavec and all 3 other living labs	30% water 40% electric power
	Ski lifts	Verbier, Madonna di Campiglio (comparing system performance)	Under investigation
		Verbier, Madonna di Campiglio, Les Orres (lift speed regulation)	10% electric power
	Operation buildings	Madonna di Campiglio, Verbier, Les Orres	See corresponding reports in the Results section of the website. Generally up to 20% energy.
	Snow grooming: monitoring engine consumption	Verbier, Les Orres, Madonna di Campiglio	8% reduction (Verbier) 100 tEqCO <sub>2</sub> /year (Les Orres)
	Public lighting	Les Orres (LED adoption + supervision)	50% electric power
EMS	Snow production, ski lifts, building heating	Madonna di Campiglio, Verbier, Les Orres	20% energy (electricity) 25% energy cost
Water management supervision & control	Lake Montagnoli Resort consumption	Madonna di Campiglio Les Orres	Under investigation Under investigation
Green energy production	Hydroelectricity	Les Orres	Potential of 22 GWh yearly
	Photovoltaic	Madonna di Campiglio Les Orres	Under investigation 365 kWc, 445 MWh yearly (parking shades)

Table 2 – review of main results measured in the living labs

## Smart Altitude Decision-making Tree

The Smart Altitude Decision-Making Tree has been designed as a comprehensive approach of parameters envisaged for the implementation of low-carbon interventions in alpine winter tourism areas. It starts with an overview of the impact of climate change in winter tourism territories, providing a literature review of climate adaptation and mitigation in these regions. The importance of achieving synergies between adaptation and mitigation is also highlighted. The Smart Altitude Decision-Making Tree is then reported graphically and described, as a step-by-step process to plan and implement low carbon measures in ski resorts.

The DMT structure is provided in Figure 1, which summarises the key steps allowing ski resort operators to successfully implement and enhance mitigation and adaptation measures. Each step refers to a tool developed by the Smart Altitude project, highlighted in the yellow boxes, which enables to perform the step. The tools will be tested by Smart Altitude Living Labs and made available to the replication sites across the Alpine Space.

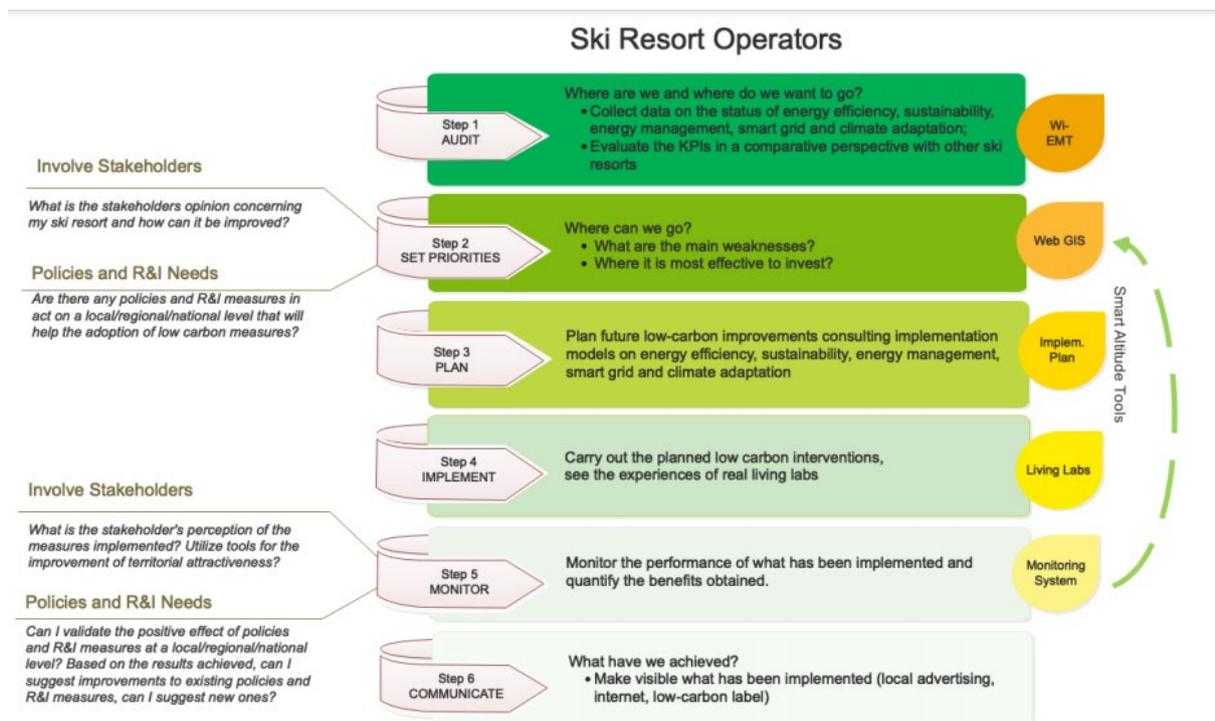


Figure 1—Smart Altitude Decision-making Tree structure

## Smart Altitude Replication roadmap

The Smart Altitude replication roadmap is fully described in the corresponding report<sup>14</sup>. The full process delivered during the project is summarised in the timeline below:

<sup>14</sup> [https://www.alpine-space.eu/projects/smart-altitude/results/wpt4/smart-altitude\\_d4-2-1-replication-roadmap.pdf](https://www.alpine-space.eu/projects/smart-altitude/results/wpt4/smart-altitude_d4-2-1-replication-roadmap.pdf)

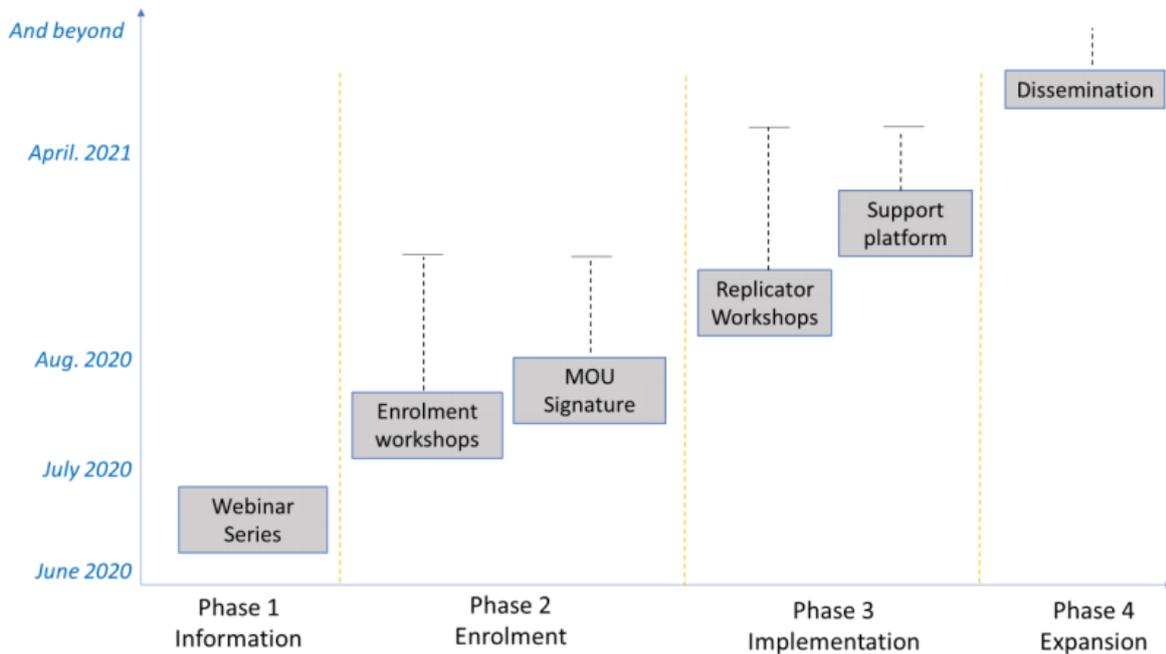


Figure 2—Smart Altitude Replication roadmap

## 5. What is the Covenant of Mayors?

The Covenant of Mayors (CoM) is an available instrument for cities and local municipalities which commit to tackle climate change through mitigation and adaptation policies. In 2008, the European Commission launched the **Covenant of Mayors (2020 initiative)** following the adoption of the EU climate and energy package in 2007, to endorse and support the efforts of local authorities in implementing sustainable energy policies for a low carbon future. The initiative aimed to convene local and regional authorities voluntarily committing to implement sustainability policies on their territories and to provide them with harmonised data compilation, methodological and reporting framework, to translate their greenhouse gas (GHG) emissions reduction ambitions into reality<sup>15</sup>.

In 2015, the "**Covenant of Mayors for Climate and Energy (2030 targets)**" was launched to reinforce the initial commitments. The initiative is based on three pillars: 1) mitigation (aiming to reduce emissions by at least 40% by 2030); 2) adaptation to climate change; 3) secure, sustainable, and affordable energy. By signing the convention, public administrations commit to developing a Sustainable Energy and Climate Action Plan (SECAP), focused on 2030, in which an inventory of baseline emissions and an assessment of vulnerability and risks related to the specific plan should be included as a basis for identifying mitigation and adaptation actions in their territory.

To date (2020), in the Province of Trento 29 covenants have been signed since 2010. With 3,325 covenants, Italy is the first European country per number of municipalities adhering to the CoM. Then

<sup>15</sup> Bertoldi P. (editor), Guidebook 'How to develop a Sustainable Energy and Climate Action Plan (SECAP) – Part 1 - The SECAP process, step-by-step towards low carbon and climate resilient cities by 2030, EUR 29412 EN, Publications Office of the European Union, Luxembourg, 2018, ISBN 978-92-79-96847-1, doi:10.2760/223399, JRC112986

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comes France with 86 municipalities, Germany with 62 signatories since 2008, 29 in Slovenia, 13 projects in Austria—most of them focused on climate mitigation action<sup>16</sup>—and 9 in Switzerland.

In the Alpine Space, the EUSALP AG9's Energy Observatory Workshop (2018)<sup>17</sup> presented CoM-related programs, actions and results in the Alpine Space. EUSALP Energy Survey 2017 that collected regional energy data of all regions of the Alpine arch in 2017, and the JRC, European Commission, gave insights into energy data collection methods in the frame of the Covenant of Mayors<sup>18</sup> the Office for Energy Saving and Renewable Energy (Piedmont Region) presented the results of the project Data4Action that facilitated the establishment of regional energy observatories in Europe.

## 6. What are the Sustainable Energy and Climate Action Plans (SECAPs)?

The Sustainable Energy and Climate Action Plan (SECAP) is the successor of the Sustainable Energy Action Plan (SEAP). It is the key document that sets out how the Covenant will achieve its commitments by 2030. The development of the SECAP is mainly based on the results of the Baseline Emissions Inventory (BEI) and the Climate Change Risk and Vulnerability Assessment (RVA). Through the development of the BEI, the Signatory is able to gain an overview of its greenhouse gas (GHG) emissions and define appropriate strategies to achieve its reduction target (by at least 40% by 2030 compared to the baseline). Similarly, the RVA identifies the most relevant climate risks and vulnerabilities affecting the local authority, facilitating the process of addressing these risks through the development of an adaptation strategy and the identification of appropriate adaptation actions. Through the combination of these aspects, the SECAP defines concrete measures for climate mitigation and adaptation, with assigned timelines and responsibilities, translating the long-term strategy into action. Signatories commit to submitting their SECAP within two years of joining. Figure 3 below presents the SECAP process and its link to CoM.

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<sup>16</sup> Covenant of Mayors. Action Plans. Available at: <https://www.covenantofmayors.eu/plans-and-actions/action-plans.html>

<sup>17</sup> <https://www.alpine-region.eu/events/1st-experts-workshop-eusalp-energy-observatory>

<sup>18</sup> [https://www.alpine-region.eu/sites/default/files/uploads/event/1011/attachments/koffi\\_jrc\\_covenant\\_of\\_mayors.pdf](https://www.alpine-region.eu/sites/default/files/uploads/event/1011/attachments/koffi_jrc_covenant_of_mayors.pdf)



Figure 3 – The SECAP process – Source: Guidebook “how to develop a Sustainable Energy and Climate Action Plan”<sup>19</sup>

## 7. Benefits expected from SECAPs implementation

The main benefits that local authorities can expect from SECAPs implementation are listed below, drawn from the SECAP guidebook by JRC<sup>20</sup>:

### Territorial benefits

- Contribute to the global fight against Climate Change - the global decrease of greenhouse gases will also protect the city against Climate Change
- Demonstrate commitment to environmental protection and efficient management of resources
- Participation of civil society, improvement of local democracy
- Improve the city's/territory image
- Political visibility during the process
- Revive the sense of community around a common project
- Economic and employment benefits (retrofitting of buildings...)
- Better energy efficiency and savings on the energy bill
- Obtain a clear, honest and comprehensive picture of budgetary outflows connected with energy use and an identification of weak points
- Develop a clear, holistic and realistic strategy for improvement in the situation

<sup>19</sup> *Op. Cit.* See note 1.

<sup>20</sup> *OP. Cit.* See note 15.

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- Improve citizens well-being (reducing energy poverty)
  - Local health and quality of life (reduced traffic congestion, improved air quality ...)
  - Improve long-term energetic independence of the city
  - Eventual synergies with existing commitments and policies and systemic approach to energy and climate policies
  - Better position for implementation of national and/or EU policies and legislation
  - Reduction of potential impacts of Climate Change and related losses and damages
  - Climate-proof buildings and resilient productive systems
  - Improved health, housing, sanitation indicators, among others, for vulnerable social groups
  - Proactive and long-term planning based on long-term risk reduction and cross-cutting benefits

### Financial benefits

- Preparedness for better use of available financial resources (local, EU grants and financial schemes)
- Access to National/European funding
- Secure future financial resources through energy savings and local energy production
- Preparedness for better use of available financial resources (local, EU grants and financial schemes)
- Benefits from networking with other Covenant of Mayors signatories with a view to funding opportunities

## 8. Status of SECAPs implementation across the Alpine Space region

### Short review

**In the Alpine macro region, Italy** presents several examples of SECAPs, such as the one signed by the Val di Non community, a district of 30 municipalities in the province of Trento, which aims at improving the local environmental policy strategy. The ‘Val di Non’ Community is also adhering to the EMAS European Regulation by involving citizens, stakeholders in the policy implementation process, supporting sustainable production, waste and energy use reduction, collaborating with other administrations and organisations to promote environmentally sustainable tourism in the area<sup>21</sup>.

**In France**, the PCAET and TEPOS-CV programs are equivalent or closely related to SECAPs programs. Numerous territories are involved in these programs in the French Alps, such as Chamonix Mont Blanc Valley Joint Local Authority, including climate mitigation and adaptation targets, focused on the transport and tourism sector in the Alpine area, the Grenoble-Alpes Métropole and the Regional Natural Park of Vercors SECAPs, etc.

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<sup>21</sup> SECAP Val di Non.

[https://mycovenant.eumayors.eu/storage/web/mc\\_covenant/documents/8/oHZEtPe9TEtn4CQY6dL0adQcYRAurZl.pdf](https://mycovenant.eumayors.eu/storage/web/mc_covenant/documents/8/oHZEtPe9TEtn4CQY6dL0adQcYRAurZl.pdf)

**SEAP\_Alps**<sup>22</sup> (2012-2015) has adapted the SEAP to Alpine regions, thereby providing local authorities with a joint methodology for energy and climate adaptation planning. In order to assist Alpine Space decision makers in drafting SEAPs in their own communities, the project has provided a platform for knowledge transfer and capacity building. Furthermore, SEAP\_Alps has tested a new public-private investment concept, which would allow municipalities to meet energy-efficiency requirements for buildings. In the framework of SEAP\_Alps, **Climate Alliance** led the advanced training of project partners on a range of relevant topics in order to guarantee optimal support for the local implementation of an integrated approach. Climate Alliance also built a multilingual online platform on local adaptation and mitigation strategies – a tool that is likely to assist municipalities far beyond the project. The project has supported more than 60 alpine municipalities in setting up local climate plans.

SEAP\_Alps Online Action Tool were designed to provide valuable assistance to municipalities in finding out which sustainable energy projects can be considered for the action plan. Within each area of intervention, a variety of possible actions are displayed, complemented by examples which are provided in project sheets. The tool was tested with 57 Municipalities and 46 SEAPs have been drafted setting commitments to 2020 targets.

**The “SECAP” Italia-Slovenija Interreg project.**<sup>23</sup> According to the project website, “The overall objective of ‘SECAP’ is to foster the sustainable development of the cross-border territory by promoting low-carbon strategies for all types of territory, in particular urban areas, creating relevant adaptation and mitigation measures (Axis 2, priority 4e). The project, in fact, will lead to the cross-border sharing of tools, methodologies and databases and will generate positive effects on local planning in the whole programme area. The transition to a low-carbon society will be implemented in the infrastructure interventions of PP4 and PP10 and in the evolution of SEAPs into CFSP for some municipalities/ITUs/metropolitan cities. The sustainable development models of the Covenant of Mayors will therefore be promoted by improving the quality of life and resilience to climate change”.

Among other results, this INTERREG cross-border program will be used as a basis for a coordinated approach to convert SEAPs into SECAPs, with a focus on the transition from mitigation to adaptation.

### Barriers and obstacles

This Gap analysis aims at identifying and understanding key missing policies in the countries mentioned in order to build a framework that, combined with existing policies, could serve as inspiration and guideline to the implementation of new environmental, climate-related measures. The fundamental gaps identified lie in the climate and energy action plans by 2050 which are yet to be implemented by presenting new specific policies regarding adaptation strategies and related regulations for regions to adapt to climate change (particularly in Austria and Germany). For example, the Italian national and regional action plans, except for Lombardy, do not consider the link between climate change and tourism sector vulnerabilities, especially in the Alpine mountain regions. The issues are increasingly difficult at local levels where concrete instruments still need to be developed and transferred into laws

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<sup>22</sup> <http://www.climatealliance.org/activities/projects/seap-alps.html> and [http://alpine-space.org/2007-2013/uploads/tx\\_txrunningprojects/SEAP\\_ALPS\\_Final\\_achievements\\_summary.pdf](http://alpine-space.org/2007-2013/uploads/tx_txrunningprojects/SEAP_ALPS_Final_achievements_summary.pdf)

<sup>23</sup> <https://www.ita-slo.eu/en/secap>

and specialised plans<sup>59</sup>. The Covenant of Mayors, which could be a useful planning instrument for the Living Labs, has not been signed by their respective local councils. Delays in meeting the short-term targets set by the national strategies and regional mitigation action plans necessarily lead to inefficient and undeveloped plans by local councils and communities to build sustainable mobility and infrastructure solutions. This could be also partially due to the absence of specific personnel and resources in public administrations, such as Sustainability and Climate officers, which could coordinate inter-sectoral measures and evaluate the progress of the projects. Overall, more coordination and multilevel governance is needed, so that locally addressed solutions can be integrated and supported by wider plans across Alpine mountain areas, regional and national scale. Scarce investments in Research and Innovations are also identified at all levels by Project partners. In addition, Smart Altitude partners highlight an insufficient operational, technical, and capacity building support from national and regional organisations toward local authorities and ski resorts, particularly in the development of Energy Management Systems and in spreading sustainable practices in the energy, mobility, and tourism sector

## 9. Conclusion

Throughout this report, the approach and results of the Smart Altitude project have been summarised with regard to climate change mitigation and adaptation actions. Smart Altitude fits very well into the general framework of European actions such as the Covenant of Mayors, the establishment of SECAPs and more specifically the work of the EUSALP Action Groups as described in the reports of the specific contributions of the project to the various working groups, in particular Groups 1 and 9. Although the focus of Smart Altitude is more on local authorities linked to mountain resorts than on "cities" per se, it is clear that the continuation of the project, in a form yet to be defined, could contribute to the adoption of SECAPs or their equivalents in the Alpine region, particularly in territories that have not joined the Covenant of Mayors and the SECAP approach.