

## WP T4 Replication and Knowledge Transfer

### Activity A.T 4.1 Recommendations for low carbon winter tourism regions

## EUSALP Recommendations and contribution reports

### D.T4.1.3.1 – Overview of Smart Altitude's contribution to the EUSALP AGs

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# Contribution of Smart Altitude to EUSALP AGs

## 1. Executive summary / Brief

This paper aims at identifying the interest for EUSALP to fast-track the deployment of the Smart Altitude approach throughout the Alpine region and to propose levers for action.

Given its purpose and the needs to be covered for its successful deployment, Smart Altitude project fits perfectly into the strategic objectives of EUSALP and is at the crossroads of almost all the EUSALP action groups: its achievements can contribute directly to the objectives of 5 of them (AG1 R&I ecosystem, AG2 Economic development, AG 6 Resources, AG 8 Risk governance, AG9 Energy) but can also rely on levers in the fields covered by 2 others (AG 3 Labour market, education and training, AG 4 Mobility) and constitute a case study for promoting the issues promoted by another 2 (AG5 Connectivity and accessibility and AG7 Green Infrastructure).

## 2. Introduction

Smart Altitude is an Interreg funded project demonstrating an integrated framework for a low-carbon and resilient future in Alpine winter tourism regions.

The project developed a decision support toolkit providing a step-by-step approach to energy transition of ski resorts, tested in four Living Labs across France, Italy, Slovenia and Switzerland and now used across other replicating ski resorts.

Smart Altitude will close in April 2021, leaving available:

- The online Toolkit and a platform supporting ski resorts willing to adopt its approach.
- A series of implementation models providing guidance and examples for mitigation and adaptation in ski areas.
- A replication roadmap.
- A network of low-carbon winter tourism regions committed to support the transition towards sustainable and resilient winter tourism destinations across the Alpine Space.

This paper aims at identifying the interest for EUSALP to fast-track the deployment of the Smart Altitude approach throughout the Alpine region and to propose levers for action.

Given its purpose and the needs to be covered for its successful deployment, Smart Altitude project fits perfectly into the strategic objectives of EUSALP and is at the crossroads of almost all the EUSALP action groups: its achievements can contribute directly to the objectives of 5 of them (AG1 R&I ecosystem, AG2 Economic development, AG 6 Resources, AG 8 Risk governance, AG9 Energy) but can also rely on levers in the fields covered by 2 others (AG 3 Labour market, education and training, AG 4 Mobility) and constitute a case study for promoting the issues promoted by another 2 (AG5 Connectivity and accessibility and AG7 Green Infrastructure).

As its main objective, the EU Strategy for the Alpine Region aims to ensure that this region remains one of the most attractive areas in Europe, taking better advantage of its assets and seizing its opportunities for sustainable and innovative development in a European context<sup>1</sup>.

- 1st Thematic Policy Area: economic growth and innovation with the objective: of ensuring fair access to job opportunities, building on the high competitiveness of the Region.
- 2nd Thematic Policy Area: mobility and connectivity with the objective of sustainable internal and external accessibility to all.
- 3rd Thematic Policy Area: environment and energy with the objective of a more inclusive environmental framework for all and renewable and reliable energy solutions for the future.
- Cross-cutting Policy Area: governance, including institutional capacity with the objective of establishing a sound macro-regional governance model for the Region.

With regard to these four major objectives, the Smart Altitude project is a highly relevant approach as a federating, pragmatic project adapted to the specificities of the resorts, which, by starting with energy policy, can generate a virtuous dynamic that extends to other components of their management.

- **Growth and innovation** – by developing an ambitious transformation of the practices of resorts in terms of energy management, Smart Altitude not only generates sustainable economic activity (creation of expert jobs, housing renovation programme, deployment of the necessary technical equipment), but also stimulates the innovation ecosystem to produce energy technologies adapted to the specificities of the resorts (mainly in the following areas: reduction of energy consumption, renewable energy production and storage, system integration).
- **Environmental framework for all and renewable and reliable energy solutions for the future** – all resorts, whatever their size and governance, are concerned by the energy policy, for both ecological and economic reasons. To be fully effective, the Smart Altitude approach must ultimately bring together all the stakeholders involved in a resort (lift operators, public authorities, property managers, individual residents, or visitors). By focusing on energy policy management, Smart Altitude offers resorts great potential for progress by aiming to equip them with central supervision/management systems. Such systems are essential for monitoring consumption, which makes it possible to identify areas for improvement and manage energy flows in real time, and for adapting equipment and systems in a context of very high seasonality. In addition, the solutions deployed are based on transversal digital technologies that can be adapted to the different components of a global approach to infrastructure management: in addition to energy flows, the management system could eventually integrate water and waste management, and even certain aspects of mobility by relying on low-speed networks (or more powerful networks in the future) to give the resorts the means to design and pilot an integrated environmental policy in real time.
- **Mobility and connectivity** – by promoting this overall approach, the Smart Altitude approach is naturally intended to encourage the transformation of mobility practices (intra-station and station/valley scales) in the long term to serve a low-carbon strategy.
- **Governance** – including institutional capacity with the objective of establishing a sound macro-regional governance model for the Region. Given its holistic spectrum of intervention and approach, the coordinated deployment of Smart Altitude at the Alpine space's level would be a good first lever for the launch of an energy transformation policy specific to the Alpine space.

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<sup>1</sup> <https://www.alpine-region.eu/node/21>

It is fully logical that Smart Altitude has been carried out in the framework of the Interreg Alpine Space programme, as it directly serves several of its objectives. Its deployment could help to articulate this programme with the general strategy implemented in the framework of EUSALP.

During the 2021-27 programming period, the priorities envisaged for ASP at this stage are<sup>2</sup> the following:

- Priority 1: climate resilient and green Alpine region
  - Promoting climate change adaptation, risk prevention and disaster resilience.
  - Enhancing biodiversity, green infrastructure in the urban environment and reducing pollution.
- Priority 2: carbon neutral and resource sensitive Alpine region
  - Promoting energy efficiency.
  - Promoting the transition to a circular economy.
- Priority 3: innovation and digitalisation oriented green Alpine region
  - Enhancing research and innovation capacities and the uptake of advanced technologies.
  - Reaping the benefits of digitisation for citizens, companies and governments.
- Priority 4: cooperatively managed and developed Alpine region.
  - Enhance institutional capacity of public authorities and stakeholders to implement EUSALP (Interreg specific PO).

The objectives and the nature of the Smart Altitude approach position this project at the crossroads of these different priorities:

- Priority 1: the motivation for the Smart Altitude approach is to enable resorts to adapt their activities to the climate change that directly threatens their equilibrium. It is therefore directly involved in promoting the necessary changes and increasing the resilience of Alpine space's actors.
- Priority 2: the core of the Smart Altitude approach is to optimise the energy consumption of the resorts, thus enabling them to take their share of the effort in a more responsible management of resources in Alpine space.
- Priority 3: based on the mobilisation of technologies and digital infrastructures adapted to the specific context of the resorts, Smart Altitude is an archetypal project that mobilises the resources of digital innovation for the benefit of all the stakeholders.
- Priority 4: by providing a pragmatic, articulated and replicable response to a challenge that concerns all the territories of the Alpine arc (climate change), Smart Altitude constitutes a natural object of cooperation to federate around a common problem. From this point of view, the institutional anchoring of the steering of the approach and its replication within EUSALP could constitute a demonstrator of the reinforcement of institutional capacities for the implementation of an Alpine macro-regional strategy.

It seems therefore logical to mobilize ASP 2021 27 funding (building for example on AlpGov 2 project<sup>3</sup> framework) to build on the achievements of Smart Altitude to serve EUSALP Action groups objectives.

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<sup>2</sup>NB : at the time of writing , this is a provisional version of the priorities (they are not validated by the Commission yet).

<sup>3</sup> AlpGov 2 is a project that “aims at enhancing EUSALP's governance structures and mechanisms to push the Strategy towards a future of embedding into the mainstream policies for regional development and cohesion”. More information at <https://www.alpine-region.eu/projects/alpgov-2>

### 3. Recommendations for action groups

#### AG 1 Research and innovation

*Please refer to the specific deliverable on AG 1<sup>4</sup>:*

#### AG 2 Economic development

##### ***Specific Objectives served by Smart Altitude***

- to move higher up value chains or adjusting products and services to the green economy.
- to bridge different policies and efforts in order to stimulate the transformation of the industrial structure and drive job creation and growth.
- to support innovation by making better use of cluster initiatives.

##### ***Recommendations***

The experience of the Smart Altitude project and of some national initiatives in terms of specific support for the transformation of mountain resorts proves that public investments in this area have significant economic potential:

- They allow the modernization of the business model of the economic actors involved in the operation of ski lifts by encouraging them to incorporate the challenges of energy transition into their operations and to enter into a logic of continuous improvement in this area;
- They create value for the local economic players working on the necessary transformations (energy renovation, modernization of communication infrastructures);
- They enable the creation of jobs dedicated to support the energy transition (see part on AG3).

As an example, within the framework of the "Stations de demain" (resorts for tomorrow) contract, the Provence-Alpes-Côte d'Azur Region set up a regional intervention mechanism with a budget of 50 million euros over the period 2016-2020 intended to relaunch the investment dynamics to encourage the emergence of intelligent, sustainable and connected resorts. The aim was to strengthen economic viability, tourism development and to commit the resorts to a perspective of digital, energy and ecological excellence. 19 "Stations de demain" contracts were signed, enabling 42 mountain resorts to benefit from financial support from the Provence-Alpes Côte d'Azur Region. According to the analyses carried out on this system, it was calculated that 1 euro of regional subsidy had generated 4 euros of investments in the resorts.

In order to ensure the optimal allocation of funds to launch similar dynamics at the scale of the Alpine space, the Smart Altitude project recommends:

- To set up a coordination mechanism at the EUSALP level to ensure the optimal allocation on the programming period 2021-27 of the funds necessary to cover the corresponding needs of the resorts (which could come *a priori* from at least 3 different supports: the Interreg Alpine Space Program, LIFE programme-Clean Energy Transition sub-programme and Horizon Europe)<sup>5</sup>.

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<sup>4</sup> D.T4.1.3.2 – S3 Strategies for AG1

<sup>5</sup> LINK TO paper on regional recommendations

## AG 3 Labour market, education and training

### *Specific Objective served by Smart Altitude*

- The dual vocational training systems of the Alpine states are very different concerning the actors, the contents and the structures involved. On this purpose, with a view to improve cross boarder cooperation and allow the exchange of best practices, the long-term aim is to establish a common macroregional educational space in which vocational professions and the related certificates are reciprocally acknowledged.

### *Recommendations*

The success of the energy transition in the Alpine arc will depend on the development of a pool of skills to support the different levels of public actors in this specific field (regions and resorts). The aim is to equip the current and future actors with the necessary skills to systematically include low-carbon issues in both the political decision-making process and the operational management of the resorts. This would involve encouraging the creation of expert positions dedicated to supporting the transformation and the concomitant implementation of dedicated training courses at the Alpine space level to create a training programme for these experts. Therefore, Smart Altitude recommends to:

- Promote the creation of jobs necessary for the implementation of an energy transition in the Alpine space: mountain resorts usually lack of financial and human means to shape low-carbon energy strategies and to ensure their implementation. It is all the more difficult that this implementation implies to tackle several challenges: organizational transformation, fine planning of the changes to be made according to the new technological choices, their deployment duration and the need to deploy them in an agenda constrained by the activity cycles (off-season deployment, political cycles). Thus, their needs for experts are critical both for designing and implementing their low-carbon strategy. Whether it is consultants in private firms, jobs as energy managers within municipalities and ski-lift companies or energy renovation officers, the deployment of a low-carbon strategy in the Alpine space is potentially a major job creator.
- Create dedicated training courses to build these capacities: this could be done through the cooperation of the universities of the Alpine space in order to promote the sharing of skills, the networking and the visibility of the issues related to the implementation of low carbon strategies in mountain resorts. It would also allow to create European career paths for specialists in these matters and thus, to increase the attractiveness of their professions. This would involve encouraging universities to put in place training curricula dedicated to energy policy management in mountain resorts (which may include training on energy itself but also mobility and energy renovation and the presentation of Smart Altitude toolbox) for the experts but also for public decision makers as well as managers of ski resorts' operations.

## AG 4 Mobility

### *Specific Objectives served by Smart Altitude*

- To promote inter-modality and interoperability in passenger and freight transport by supporting and fostering the removal of infrastructure bottlenecks, by bridging missing links, coordinating planning and timetables of public transport, modernizing infrastructure and enhancing cooperation. AG4 is addressing this objective by focusing on infrastructure for sustainable transport in passenger- and combined transport as well as interconnecting public transport systems, focusing on operations and



information and ticketing services.

- To support the modal shift from road to rail. The Alpine regions are particularly sensitive to negative environmental and social impacts caused by the excessive traffic flow of freight and passenger transport through the Alps. In order to tackle this challenge, the AG4 promotes the harmonization and implementation of modal shift policies with a focus on toll systems.
- To develop cooperation and greater integration between the existing bodies and structures in the field of transport.

### ***Recommendation***

The evolution of the mobility behaviour of individual actors will play a determining role in the carbon impact of their trips to the resorts. This is why the provision of a free tool to enable them to optimise this footprint would be important. Smart Altitude recommends to:

- Develop a transnational route calculator that could give to individuals the possibility of accurately assessing the carbon impact of their journey, but also to have all the information needed to organise their entire journey by public transport. This tool could be made available on the websites of the resorts and of all individual and collective accommodation providers to easily obtain the information needed to organise mobility. This will allow a particular effort to be made on the last kilometre, where transport methods are generally poorly referenced (very local and only in season, such as bus shuttles). The aim is to provide as many integrated and easy-to-use tools as possible to provide means of organising carbon-free travel to the foot of the slopes.

## **AG 5 Connectivity and accessibility**

### ***Specific Objectives served by Smart Altitude***

- Propose technical solution with focus on ICT
- Encourage the exchange of experiences in the EUSALP perimeter
- Offer ICT solutions for the work of the other action groups

The deployment of the Smart Altitude approach requires the capacity to collect, process and transmit data from sensors which must be sent to automatic systems that process and transmit them to supervision platforms. Technical solutions adapted to the specific geographical constraints of mountainous areas are therefore required: either optical fiber when available or LoRa networks (networks based on chirp spread spectrum modulation, which have low power characteristics like FSK modulation but can be used for long range communications).

- Based on the solutions developed within the framework of the project, Smart Altitude could therefore constitute a successful use case for the mobilization of ICTs for the energy transition in the Alpine region.

## **AG 6 Resources**

### ***Specific Objective served by Smart Altitude***

- “Integrated and sustainable water management” (sub-topic 3) – River restoration and sediment management through the implementation of the “green infrastructure” concept as a win-win



strategy for the achievement of the objectives of both the EU Water Framework Directive and the EU Flood Directive. In the field of water-demand and supply management options for preventing potential conflicts among sectors and actors in case of peaks of demand and/or regional droughts shall be identified.

### ***Recommendation***

Mountain resorts are primarily concerned by the issues surrounding water resources and the conflicts of use that result from their scarcity due to climate change. Resorts experience lack of natural snow at times, due to changing weather condition and rising temperatures while wanting to extend the skiing season. Hence, they needed to look for alternative solutions such as artificial snowmaking to guarantee a longer ski-season, which however, brings its own challenges.

The snow-making process requires high energy and water. Especially the water consumption can impact on local water management and ecosystems along water bodies, if not carefully managed to ensure an optimal and sustainable use. It also faces competing uses from local agriculture. Therefore, tackling improvement potentials in this area have to be prioritized above all else.

In the framework of the smart altitude project, many innovative solutions have been developed to meet these challenges like: deployment of Intelligent water monitoring (temperature sensors in the water reservoir that provide real-time data on the water temperature at different depths, water surface and weather conditions to support the optimization of the artificial snow production process thus saving energy and water and recovering heat), low-energy snow canons and lances (e.g. a snow lance not requiring a compressor), GPS-guided snow-management to optimize snow-thickness, which substantially reduces the need for snowmaking,...

Building on these achievements, Smart Altitude recommends:

- to ensure in the framework of AG 6 the promotion of the snowmaking optimization solutions tested in Smart Altitude as an important tool to limit conflicts of use around the water resource in the Alpine space.

## **AG 7 Green infrastructure**

### ***Specific Objective served by Smart Altitude***

- To allow the benefits of ecological connectivity to emerge at ecosystem and societal dimensions, enhancing resilience to threats such as climate change.

### ***Recommendation***

The Alpine region is a prime example of green infrastructure: “Green infrastructure is a strategically planned network of natural and semi-natural areas with other environmental features designed and managed to deliver a wide range of ecosystem services such as water purification, air quality, space for recreation and climate mitigation and adaptation. This network of green (land) and blue (water) spaces can improve environmental conditions and therefore citizens' health and quality of life. It also supports a green economy, creates job opportunities and enhances biodiversity.”<sup>6</sup>

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<sup>6</sup> [https://ec.europa.eu/environment/nature/ecosystems/index\\_en.htm](https://ec.europa.eu/environment/nature/ecosystems/index_en.htm)

The creation of participative dynamics around the preservation and enhancement of this area is therefore fully in line with the European Union's Green Infrastructure objectives. Indeed, the deployment of the Smart Altitude approach will require a broad mobilisation of all stakeholders in support of the objective of rationalising the consumption of resources (energy, water), thus contributing to the preservation of the ecosystem.

For a low-carbon strategy to be successful, buy-in from all stakeholders and changes in individual behaviour are key success factors. It is important to raise awareness of the fact that the future of the resort, of their living environment and of their territory depends to a large extent on individual and collective commitments. The main obstacle to overcome is the reluctance of users to adapt their individual behaviour because of inconvenience caused (comfort's loss when abandoning individual vehicle, noise from alternative energy resources such as turbines, modification of landscapes, resistance to change, ...)

- Smart Altitude can therefore be considered as a case study of a citizen mobilization around a low-carbon strategy specific to the Alpine territories which contributes directly to the reduction of greenhouse gases and therefore to the preservation of the environment.

## AG 8 Risk governance

### *Specific Objectives served by Smart Altitude*

- Identification of good practice solutions in tackling challenges in natural hazard and climate change adaptation policy.
- Promoting, developing and implementing local, regional and international pilot projects and programs based on strategic priorities, and exploring funding opportunities on both EU as well as national/regional/private levels.

### *Recommendations*

The logic of Smart Altitude is based on the implementation of a collaborative network between the resorts of the Alpine arc to catalyse the development of their low carbon strategies. The enhancement and extension of this approach could be put at the service of EUSALP risk governance. To this end, Smart Altitude recommends to:

- Set up an observatory for the energy transition in the Alpine space, which would make it possible to monitor the progress indicators of the resorts in this field, these indicators being based on the targets set in the National Energy and Climate Plans (NECPs) for mountain resorts. These indicators could be built on the basis of the set of Key Performance Indicators (KPI) defined in the Smart Altitude framework, namely the audit tool, called "Wi-EMT" (Winter tourism Eco-energy Management Tool) which includes KPI's related to an ecological, energetic and management evaluation for a ski resort.
- Building on Smart Altitude Web-based GIS<sup>7</sup>, develop an aggregated tool, accessible in a single place for all the actors of the resorts to give access to the required information to assess their situation:

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<sup>7</sup> Part of the Smart Altitude project is the development of a web-based GIS application to visualize territorial assets, untapped renewable energy potential and key performance indicators for the living labs and the replication sites. A geographic Information System (GIS) is a computer system designed to capture, store, manipulate and present spatial (or geographic) data. GIS can show many different kinds of data on one map, using any information that includes a location. In this way, people can compare different elements in order to understand how they relate to one another. The GIS application is one of the project tools that will support the prioritization of low-carbon operations.

one of the most important obstacles to progress in launching low-carbon strategies in the resorts is the lack of reliable information, both for the decision making of policy makers and for the information of stakeholders and therefore the determination of their individual behaviour. A structuring initiative at EU level to create the necessary tool would therefore have a major transformational impact. This tool, which would consist of an aggregation and interfacing of existing sources, could have several components:

- A geographic information system that would make it possible to know, for a given territory, the main characteristics necessary to assess its situation in terms of energy transition (energy consumption, water consumption, number of inhabitants, structure of the building stock, etc.)
- Scenario-building tools to simulate the impact of a given potential measure (simulation of the impact in terms of energy, economic impact, job creation, fiscal potential, etc.)
- A mapping tool of the different ongoing or completed projects on low carbon policies in resorts (based on WIKIAlps).

## AG 9 Energy

*Please refer to the 3 specific deliverables directed to AG 9<sup>8</sup>: for specific elements on energy management systems, energy efficiency and smart grids in mountains areas.*

## Conclusion

Through its concerted action, based on the systematic exploration of the state of the art of energy efficiency technologies and their deployment in 4 pilot sites representative of the diversity of the Alpine space, the Smart Altitude project has demonstrated the interest and feasibility of reducing the carbon footprint and energy consumption in mountain resorts. This work has resulted in the development of reliable common criteria and indicators to measure the efforts undertaken, the implementation of a detailed process to achieve the objectives, a collection of feedback from the 4 living labs and the organisation of a replication programme to which 26 Alpine resorts have already subscribed.

Several reports have been written to develop recommendations for regional, national and European policy makers to facilitate the energy transition of mountain resorts in the Alpine region. Of these, five were specifically aimed at the EUSALP Action Groups, including the present report that propose an overview of the Smart Altitude project contribution to all AG, one dedicated to AG1, whose activity is focused on the implementation of research and innovation in Alpine Regions, and three reports referring to AG 9, whose activity is dedicated to energy efficiency and renewable energies.

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<sup>8</sup> D.T4.1.3.3, D.T4.1.3.4, D.T4.1.3.5. <https://www.alpine-space.eu/projects/smart-altitude/en/project-results/replication-and-knowledge-transfer/a.t4.1-recommendations>