

WP T4 Replication and Knowledge Transfer

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

D.T4.1.1 Regional Recommendations Paper

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Executive summary

This paper aims at identifying the leverages that can be implemented at regional level to fast-track the deployment of Smart Altitude approach over Alpine region and thus, to contribute to the European Union ambition of becoming the first climate-neutral continent by 2050 by deploying a tailored-made approach adapted to the specificities of Alpine territories.

In Europe, 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 Alps¹. In spite of their diversity, the economic and social models of mountain resorts have one thing in common: their high vulnerability to climate change.

To tackle this challenge, Smart Altitude proposes:

- To develop a specific chapter on Smart specialization strategies (S3) in Alpine regions to promote operational excellence in winter tourism destination: this would allow to take advantage of the European context (new programming period 2021-2027 of the FESI, European Green Deal) to develop an important chapter of S3 on Energy transition adapted to the specific context of mountain resorts and to mobilize an S3 as a coordination tool for interregional cooperation.
- To leverage the different funding vectors available in the new programming period: Interreg Alpine Space Programme (ASP), LIFE programme, Clean Energy Transition Sub-programme, Horizon Europe.

The role of the Alpine regions in the deployment of the approach will be decisive. It could consist in:

- Encouraging the setting up of a territorial governance centred on low-carbon issues and taking into account the specificities of mountain territories
- Supporting the implementation of specifically designed low carbon strategies by providing expertise, financial support, capacity building tools and data.

¹ <https://www.cipra.org/en/publications/5192>

1. 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 levers that can be implemented at regional level to fast-track the deployment of the Smart Altitude approach throughout the Alpine region.

The approach followed, based on the project results and stakeholder feedback, consists of an articulated set of recommendations for the ecological transition in winter tourism intensive territories. The recommended measures will have to be linked to the regions' S3 strategies and be part of an implementation framework taking advantage of ERDF support and the regions' structuring support measures for the low-carbon development of resort/valley areas.

By deploying a tailored-made approach adapted to the specificities of the Alpine territories Regions, Smart Altitude will thus contribute to the European Union ambition of becoming the first climate-neutral continent by 2050

2. Economic, environmental and social roles of mountain resorts in the Alpine economy

The Alpine Space presents a wide economic and social diversity of its constituent regions. The whole territory includes 80 million people, covers 48 regional authorities in 7 countries (Austria, Germany, France, Italy, Liechtenstein, Slovenia, Switzerland), 5 of which are members of the Union. It is one of the most visited regions in the Union (120 million visitors per year)².

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

² <https://www.alpine-region.eu/sites/default/files/uploads/group/2266/attachments/brochure.pdf>

communities can be highly dependent on tourism activity, which brings financial resources and seasonal employment.

Numerous studies³ have pointed out the diversity among mountain resort development policies in terms of management methods, governance structure as well as implementation modalities, both within a single country and between the various countries of the Alpine Space. Moreover, there is also considerable diversity in terms of topology (altitude), geophysics (availability of renewable energy resources), economics (importance of the resort and the ski area, frequentation, links with surrounding conurbations, local, regional and national support for tourism development and investment in infrastructure).

In spite of their heterogeneity, mountain territories in the Alps have one thing in common: their high vulnerability to climate change. Climate change already impacts winter tourism regions negatively and this trend is expected to increase. Indeed, in its Special Report on the Ocean and Cryosphere⁴ (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”.

Based on regional climate predictions in the Alpine Space, a study by Bruno Abegg (2012) analysed the predicted evolution of naturally reliable ski resorts with different climate scenarios. With a global temperature rise of 2°C compared to today, the study predicts a drastic decrease of 30-90% of the number of ski resorts with naturally reliable snow cover (100 days with at least 30cm of natural snow cover in 70% of the years) for the outskirts of the Alps. Although the highest-located ski resorts in the central Alps are predicted to be less impacted, the decrease of snow reliability is significant for a global temperature rise of above 2°C. The decrease in natural snow reliability therefore implies a strong increase of needs for artificial snowmaking by the 2050s. An increase of artificial snow production however also comes with higher energy, financial and ecological costs.

In terms of economic and market impacts, a critical review of 119 academic publications carried out in 2019 (Steiger, Scott, Abegg, Pons, & Aall, 2019), 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 (Steiger, Scott, Abegg, Pons, & Aall, 2019).

Therefore, it is of the most importance to protect the local permanent population from the economic risks of a decrease in 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, e.g. through environmentally friendly summer activities, local green-energy initiatives, short cycle farming and new services for the local population. The future

³ Probst T, Hohmann R, Pütz M, Braunschweiger D, Kuhn Belaid R, Climate Adaptation Governance in the Alpine Space, Transnational Synthesis Report, 2020

⁴ <https://www.ipcc.ch/srocc/>

resides in helping the local populations to manage and take charge of the sustainable development of their community and territory.

It is therefore critical for winter tourism areas, especially for those at lower elevations to reduce their vulnerability to climate change by developing and implementing adaptation strategies along with measures for climate change mitigation that reduce their emissions of greenhouse gases. The support of the regional level to help them meet this challenge is crucial.

3. Contextual analysis of the smart specialisation strategies and main low carbon policies in the Alpine regions

Smart specialisation is an innovative approach that aims to boost growth and jobs in Europe, by enabling each region to identify and develop its own competitive advantages. Through its partnership and bottom-up approach, smart specialisation brings together local authorities, academia, business spheres and the civil society, working for the implementation of long-term growth strategies supported by EU funds.

Since 2011, the European Commission provides advice to regional and national authorities on how to develop and implement their smart specialisation strategies via a mechanism called ‘Smart Specialisation Platform’. This Platform facilitates mutual learning, data gathering, analysis, and networking opportunities for around 170 EU regions and 18 national governments. Thematic Smart Specialisation platforms have also been created. Regions join forces and pool resources on the basis of matching smart specialisation priorities in high valued added sectors.

The identified strategies set priorities at national and regional levels to build competitive advantage by developing and matching Research & Innovation (R&I) own strengths with business needs, to address emerging opportunities and market developments in a coherent manner, while avoiding duplication and fragmentation of efforts. They may take the form of, or are included in, a national or a regional R&I strategic policy framework.

In the previous programming period (2014-20) more than half of Alpine regions defined energy related issues as their priority for S3 Strategies. Specifically, when selecting the “political objective” on the Eye@RIS3 platform of the JRC⁵ 14 regions (namely: Lower Austria, Upper Austria, Tyrol, Vorarlberg, Baden Württemberg, Bavaria, Franche-Comté, Provence Alpes Côte d’Azur, Rhône-Alpes, Valle d’Aosta, Liguria, Bolzano, Trento-Veneto, Slovenia) defined “cleaner environment and efficient energy networks”, “climate change” and “sustainable energy and renewables” as one of their specialisation priorities. When doing the same exercise with “nature and biodiversity – ecotourism”, only 3 regions (namely: Slovenia, Autonomous Province Alto-Adige/Südtirol and Region Rhône-Alpes) appear to have chosen this objective.

It is therefore possible to think that low-carbon related issues are well identified as a priority by part of the regions of the Alpine Space, but that their specific applications in the context of mountain resorts and their impact on tourism are not. Indeed, among the regions which identify energy and eco-tourism as priorities, there is no significant evidence of targeted investments in the energy transition of mountain resorts as such. Instead, the investments made aim at developing palliative solutions (development of artificial snow,

⁵ Available at: <https://s3platform.jrc.ec.europa.eu/>

modernisation of grooming techniques and equipment to optimise snow management) rather than overall approaches to initiate a systemic energy transition.

In this context, there is an emerging need to align innovation roadmaps across EU policies and territories. There is also an upcoming challenge in accompanying the implementation of innovation strategies with the appropriate methodological development and related tools, with regard namely to benchmarking, transnational cooperation and mutual learning.

In particular, Smart grids are well identified in the new programming period by supporting the role of transnational R&I networks to strengthen smart energy. That is the reason why Smart Altitude aims to develop a specific chapter on S3 in Alpine regions to promote operational excellence in winter tourism destinations through concrete examples of best practices.

This would allow to take advantage of the European context (new programming period 2021-2027 of the FESI, European Green Deal) to develop an important chapter of S3 on Energy transition adapted to the specific context of mountain resorts and to mobilize an S3 as a coordination tool for interregional cooperation.

4. Identify opportunities for the development of low-carbon valley in the new programming period 2021-2027

The new programming period offers interesting opportunities to leverage on Smart Altitude achievements. Different funding vectors are potentially available in the new programming period.

A project that meets the challenges of the European EU strategy for the alpine region (EUSALP)

Considering the fact that the geographic and structural characteristics of the Alps provide good potentials to make the Alpine region a European “model region for renewable energies and energy efficiency”, Macro-regional policy planning helps the Alpine region to tackle the challenge to meet energy demand sustainably, securely and affordably.

In light of EUSALP's objectives, the following key needs for maximising the contribution of Smart Altitude can be identified:

- Energy efficiency and renewable energies clusters: applying the Smart Altitude approach to sustainable mobility at 3 levels (intrastation, station/valley, and station/conurbation), and cooperating in technical solutions, processes and products for energy efficiency with a special focus on the housing and mobility sectors.
- Greening alpine infrastructure: facilitating cooperation between professional organizations for alpine sports and tourism and energy innovation clusters with their R&I organizations.
- Support to local energy management systems: expanding the deployment of energy consumption supervision systems to the municipality or valley area.
- Better use of local energy resources: facilitating cooperation between energy, innovation clusters with their R&I organizations and alpine areas.
- Support mountain resorts in their implementation of energy efficiency and self-sufficiency solutions: further developing the toolbox and support platform for replicators beyond the Smart Altitude project.

The new multi-annual budgetary programming currently being defined offers several vectors to meet these needs.

Interreg Alpine Space Program (ASP) 2021-27

During the 2021-27 programming period, the priorities envisaged for ASP at this stage are ⁶

- 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 consider that in the framework of the ASP 2021-27 programming, this fund could contribute to launch actions to meet several needs in order to guarantee the full effect of Smart Altitude's deployment. Smart Altitude is a proven and efficient cooperation object for strengthening the governance of the EU Alpine policy, perfectly in line with the transversal objectives of the AlpGov2 project which "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"⁷ Building on the framework of AlpGov2 project, ASP funding could be focused on:

⁶NB: at the time of writing , this is a provisional version of the priorities (they are not validated by the Commission yet).

⁷ <https://www.alpine-region.eu/projects/alpgov-2>

- Investment necessary for the recruitment of experts within the EUSALP Working groups to ensure the management and coordination of the network of European actors in the field of energy transition in resorts in order to organise the sharing of good practices, data, training and the visibility of initiatives in this field. They could also be responsible for setting 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-EMT⁸” (Winter tourism Eco-energy Management Tool) which includes KPI’s related to an ecological, energetic and management evaluation for a ski resort. This monitoring data could be used to promote a labelling logic specially designed for mountain resorts. It would enable them to promote their efforts in terms of a low-carbon strategy to enhance their attractiveness and to mobilise internal stakeholders around good practice and a proven transformation model. Thus, the work carried out in the framework of Smart Altitude could contribute directly to the effort undertaken in the framework of EUSALP to build a Charter for Sustainable Resorts⁹ by informing on the best practices identified and on the conditions of their transferability. While the environmental dimension of sustainable tourism drives the various analyses and actions, it seems absolutely necessary to develop a concrete and operational contribution to mobilise as much as possible the alpine tourist destinations and resorts in the elaboration of their sustainable development strategies. Smart Altitude therefore has a key operational role to play on the theme of labelling and certification.
- Building on Smart Altitude Web-based GIS¹⁰, development of an aggregated tool, accessible in a single place for all the actors of the resorts to give access to the required information: 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)
 - A transnational route calculator to give individuals the possibility of accurately assessing the

⁸ <https://www.alpine-space.eu/projects/smart-altitude/en/project-results/measuring-visualizing-performance/key-performance-indicators-report>

⁹ <https://www.alpine-space.eu/projects/smart-altitude/results/wpt3/d.t3.3.1.pdf>

¹⁰ 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.

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 give individuals means of organising carbon-free travel to the foot of the slopes.

- From an economic point of view, the ASP funds will have to enable the development of a sustainable business model to ensure the maintenance and enrichment of this aggregated tool over its lifetime (if the data is open source, it is necessary to ensure the financing of the costs necessary for its enrichment, in particular the HR) and to guarantee attractive pricing or even free access for the end users.

LIFE programme, Sub-programme Clean Energy Transition (2021-2027)

The sub-programme Clean Energy Transition, under the proposed LIFE programme (2021-2027), is expected to support capacity building and diffusion of knowledge, skills, innovative techniques, methods and solutions for reaching the objectives of the Union legislation and policy on the transition to renewable energy and increased energy efficiency¹¹.

The resources of this programme could be used to :

- Develop and promote a model of energy community adapted to the energy specific characteristics of alpine space (seasonal consumption, geographical constraints, presence of big operators and individual consumers, ...) Such framework would make it easier for citizens, together with other market players, to team up and jointly invest in energy projects. The network of these Alpine energy communities could be facilitated by EUSALP to ensure sharing of synergies and feedback about projects involving civil societies.
- Support the investment in the technical tools needed to launch the Smart Altitude approach in resorts: integrated energy management system, smart grid, sensors, cloud infrastructures, sub-metering modules, PLCs, supervision platform, ...

Horizon Europe

Horizon Europe is the EU's key funding programme for research and innovation with a budget of €95.5 billion. It tackles climate change, helps to achieve the UN's Sustainable Development Goals and boosts the EU's competitiveness and growth. The programme facilitates collaboration and strengthens the impact of research and innovation in developing, supporting and implementing EU policies while tackling global challenges. It supports creating and better dispersing of excellent knowledge and technologies¹².

This budgetary framework would accelerate the development of technologies to meet the specific needs of mountain resorts highlighted by Smart Altitude. It could be used in two ways: developing new technologies and adapting existing technologies to the mountain environment.

¹¹<https://ec.europa.eu/easme/en/section/horizon-2020-energy-efficiency/whats-next#:~:text=The%20Commission%27s%20proposal%20for%20Horizon,innovation%20activities%20in%20energy%20efficiency.>

¹² https://ec.europa.eu/info/horizon-europe_en

Smart Altitude identified in particular 3 main areas of R&I needs

- Reduction of energy consumption for equipment, installations and building: technological breakthrough in energy consumption (eg LIDAR/snow grooming, H2 groomers, ...)
- Renewable energy
 - production: advance in photovoltaic technologies (eg bifacial, thin materials, etc...) and micro-hydroelectricity
 - storage: advance in H2 technologies (production, storage and distribution) and Li-ion batteries
- System integration: advance in smart grid technologies taking into account high seasonality energy consumption and production, adaptation of smart city digital solutions to mountain territories (digital networks, IOT, digital integration and services)

5. Conclusion: Recommendations for mountain tourism priorities at regional level

The objective for the regions is to launch or reinforce a strong dynamic for the deployment of the energy, ecological and tourism transition in the mountainous part of their territory. This is based on the one hand on the definition of a coherent regional strategy adapted to the territorial specificities (and articulated on the European and national strategies) and on the other hand, on the implementation of action levers to facilitate the deployment of efficient operational projects by the territorial structures with the appropriate level of co-power and socio-economic decision.

Their levers of action are of several kinds:

- Active participation of regional authorities in programmes decided at higher levels of governance (EUSALP) to ensure the relevance of European development strategies and their adequacy with their own territorial strategy
- Ensuring that the specific characteristics of mountain areas are taken into account in the design of public policies at regional level in all sectoral policies (tourism, digital, housing, energy management, water management, waste management) by setting up and running a network of "mountain" experts (a regional cluster of public decision-makers) from the various bodies involved in these policies (local authorities at all sub-regional levels, sectoral bodies, public agencies, etc.)
- Animation of structuring programmes to ensure the coherence of regional approaches in mountain territories
- Implementation support: providing expertise, financial support, capacity building, providing data,
- Support to the mobilisation of stakeholders

Encouraging the set-up of a territorial governance centred around low-carbon issues and taking into account the specificities of mountain territories

The goal is to implement a holistic approach to mobilize all stakeholders in order to initiate systemic transformation dynamics at the right level to fast-track the adoption of energy efficiency and self-sufficiency solutions in mountain resorts.

It is proposed to make the support of regional entities conditional on the existence of structures for defining and steering integrated low-carbon strategies at the resort/valley level. This may consist in establishing incentives for the creation of resort/valley governance schemes responsible for defining and implementing an integrated low-carbon strategy for their territory over a 10-year horizon articulated with the various existing territorial master plans.

The overall strategy that they develop should include at least an integrated vision of energy, housing renovation, mobility (soft mobility master plan for intra-station mobility, station/valley mobility, station/rest of the world mobility) and tourism policies (promotion of the territory's identity, construction of an integrated tourism offer including creation of climate friendly tourism packages with CO2 compensation tax, ...)

Incentives for the implementation of such governance could take the form of privileged access to public resources (financial and non-financial) for the resorts included in these schemes.

Example of good practice “Espaces valléens¹³” in France: an “Espace valléen” is a label granted by Regions for multi-annual strategic framework for the integrated development and diversification of tourism in the resorts/valleys space. To obtain this label, mountain territories have to put in place an integrated tourism development and diversification strategy supported by enlarged territories structured around shared governance. These strategic frameworks must integrate the issues linked to the expectations of tourists and local populations, but also take into account broader issues such as risk prevention, biodiversity preservation, water management and the development of soft mobility. Obtaining this label is a guarantee of the coherence of the strategy which favours the access of the resorts to subsidies and expertise resources.

Example of good practice Klimaschutz Gesetz¹⁴ in Baden Wurttemberg (Germany): this is a legal framework that sets greenhouse gas reduction targets for the Land. In its latest version, it obliges all public entities (municipalities, Kreis) to fill in a database on their energy consumption. Access to this database will be free, which will enable public bodies to situate themselves in relation to each other in a progress trajectory and to benefit from the financial and technical support of the Land to make progress. This is a first step towards creating an overall dynamic in terms of energy transition.

Supporting the implementation

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).

¹³ https://agence-cohesion-territoires.gouv.fr/sites/default/files/2020-06/plaquette_ev_vf_0.pdf

¹⁴ <https://um.baden-wuerttemberg.de/de/klima/klimaschutz-in-baden-wuerttemberg/klimaschutzgesetz/#:~:text=Das%20Klimaschutzgesetz%20macht%20klare%20Vorgaben,um%20mindestens%2042%20Prozent%20sinken.>

- Providing expertise

It is necessary to distinguish between two types of expertise that resorts need: design support and implementation support.

For design support, regional authorities could build up pools of experts that can be made available to local decision makers in alpine space (in-house consultants) to help them becoming aware of the issues, assessing their initial situation and then shaping their low-carbon strategies. These experts could notably rely on Smart Altitude toolbox.

This pool of experts could also take on the role of network coordinator for both the mountain sector experts mentioned above and the community of low carbon strategy experts deployed in the resorts. The necessary funding should be considered as investment (because it launches dynamics) rather than operating.

For implementation, it is necessary to allow the internalisation of expertise resources as close to the field as possible because the management of the low-carbon strategy must be anchored in the daily operation of the resort. The "strategy implementation" experts should therefore be part of the resorts' staff. It is suggested that the corresponding wage bill be partly covered by the region for the first three years, with a gradually decreasing trajectory until the savings generated by the implementation of the strategy enable the resorts to finance the post independently.

In order to determine the magnitude of the effort, we can use the example of the Auvergne Rhône Alpes Region in France: over a period of 6 years, a comparable support system costs approximately 200,000 EUR for the financing of the pool of experts plus an indicative budget of 180,000 EUR per territory supported.

- Providing financial support

Direct and indirect financial support should be given as a priority to projects that are part of the integrated territorial strategies above mentioned. The corresponding funds should be directed as a priority to certain domains.

Energy policy: the regions can help resorts to equip themselves with the technical means to implement their low-carbon strategies, whether in terms of technologies (integrated energy management system, smart grid, sensors, cloud infrastructures, sub-metering modules, PLCs, supervision platform, etc.) or infrastructures (charging stations for electric vehicles, hydrogen refuelling stations, etc.). This can be done either by subsidizing the acquisition of the necessary equipment or by setting up dedicated contracts frameworks with the main suppliers (grouped orders) and thus give mountain resorts access to better prices. In addition to financing the investments necessary for the implementation of low-carbon strategies, the regional level could create seed funds to help launch participatory projects whose profitability is low but which contribute to mobilising citizens around energy issues (renewable energies, small heating networks, methanation, etc.)

Mobility: the regions may pay subsidies to provide territories with soft mobility solutions (investment subsidy) and/or pay subsidies to transport operators to offer tourists and inhabitants very attractive prices for public transport. These subsidies could be increased in the case of integrated pricing of the transport offer on the scale of the resort/valley territory.

Whatever the area of financing, it might be appropriate to include in the criteria for awarding investment aid a minimum proportion to be devoted to energy transition issues. Conversely, it would be judicious to define criteria for capping aid to investments that have no effect on progress in this area, or even to prohibit the payment of public aid in certain cases (e.g., funding for ski lift infrastructure in resorts where the geographical

characteristics, the exposure of the slopes and the topography do not allow for the maintenance of acceptable natural snow cover over a 10-15 year period).

- Building capacity

To launch the necessary transformation dynamics and ensure their sustainability, regional authorities could put in place training and research tools for low carbon strategies in resorts. The aim is to equip the current and future actors of the resorts with the necessary skills to systematically include low-carbon issues in both the political decision-making process and the operational management of the resorts. It is possible that the implementation of such courses 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.

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 public decision makers as well as managers of ski resorts' operations.

To encourage these research dynamics, it might be appropriate for the regions to set up calls for proposals dedicated to research on the deployment of low-carbon strategies in mountain resorts. As the aim is to initiate the creation of these university programmes, it could be advisable to extend the usual three-year horizon of the calls for proposals to five years to give enough time for the universities to build appropriate partnerships and to structure their teams accordingly.

In parallel, the regions could encourage the resorts to set up partnerships with the academia on energy transition in their territories. These partnerships may include the purchase of research services by the resorts, traineeships in the resorts, capitalisation of feedback on the challenges of their transformations, ...

Example of good practice: the CREM in the canton of Valais in Switzerland (centre de recherches énergétiques et municipales)¹⁵ : co-created by the municipality of Martigny and the Ecole polytechnique fédérale de Lausanne, CREM is a structure that connects and creates synergies between local political decision-makers, economic actors and the world of research around the issues of energy sustainability in urban areas. Its aim is to provide a privileged interface between R&D, industry and municipalities in the field of energy sustainability and to contribute to a sustainable energy future in urban areas for the benefit of the community at large. In Valais, the CREM has applied this logic to the benefit of ski resorts to support them in their energy transition.

- Providing data

The provision of the data necessary for decision-making by policy-makers in resorts to enable them to develop their strategies is an important lever.

in addition to give access to databases set up at EU levels, the regions could provide the actors with mapping of existing regional resources (academic resources, advisory structures, equipment suppliers, start-ups etc.) to help resorts building their partnerships.

Mobilising stakeholders

¹⁵ <https://www.crem.ch/fr/crem/>

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. Many obstacles have to be overcome: 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, ...)

Although the regions do not necessarily have a direct link with all categories of stakeholders, their role in mobilising them can be important. They could act indirectly by encouraging the structuring of ecosystems (e.g., innovation clusters), providing financial support for the deployment of collaborative projects at various levels, or establishing conditionality in the payment of aid to local authorities (taking into account criteria such as the level of mobilisation of civil society and citizens in the projects). The regional level could also provide methods and expertise to resorts in two main areas:

- Communication

Regional level can help mountain resorts to organize constant effort of communication to enhance awareness and engage stakeholders. In particular, dedicated communication channel with local communities should be considered and planned carefully, as this represents the first step towards citizens' participation and accountability. The recommendation is to regularly inform the public about the project progress and results, especially highlighting clearly the benefits achieved and foreseen for the local communities and the region. This not only in order to increase awareness and change behaviour, but also to generate support by local communities and stakeholders, promote a coherent marketing message by all economic operators of the ski area and surrounding territories, reduce potential oppositions and increase the potential for long term sustainability of project results. For the same reason, besides local events and targeted communication materials, a potential approach is to develop specific educational and awareness raising programmes for schools, families and children related to the project and its results, also engaging them in bilateral and follow up activities connected to the project.

- Owners' mobilisation to boost renovation policy

The main challenge in this perspective is to fight against the passivity of owners in terms of energy renovation. The regional authorities could put in place various incentive levers in these different areas. It may consist in putting in place an attractive service offer for owners on the subject of energy renovation: training/awareness-raising on the challenges of energy renovation of their property in the service of the attractiveness of the territory (which is also positive for their assets), facilitation of the owners' pathway to access information, build their renovation project and be supported in the constitution of subsidy applications. Regional level could also support the creation of local jobs for energy renovation officers in the resorts to define and implement this support. Finally, the regions could also set up training courses for property management professionals (property managers, estate agents) to equip them with the skills to support their clients' reflections and energy renovation projects.