

WP T4 Replication and Knowledge Transfer

Activity A.T 4.2

D.T4.2.3 Recommendations on S3, entrepreneurship and innovation support

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1) Executive summary

The objectives of Smart Altitude are directly related to the current challenges of tourism and energy issues in the Alpine space. This paper explores the need for policy support for value creation through the implementation of low carbon policies, with a special focus on the possibilities offered by the smart specialisation strategies (S3) of the Alpine regions to maximise the effectiveness of adaptation and mitigation approaches to the challenges of the climate change.

This analysis and its set of concluding recommendations would make it possible to take advantage of the European context (new programming period 2021-2027 of the FESI, European Green Deal) to develop an important chapter of the S3 on the energy transition, fully adapted to the specific context of mountain resorts, and to mobilise it as a tool for the coordination of interregional cooperation. Specifically, the Smart Altitude project recommends to:

- Promote the interaction across the different stakeholders of tourism sector in the Alpine region through the establishment of a local/regional working table to facilitate cooperation between energy, innovation clusters and professional organizations for alpine sports and tourism with their R&I organizations and alpine areas.
- Promote the identification of the tourism sector as a Smart Specialisation priority for the next programming period: 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.
- Fast-track R&I transregional actions specific for the winter tourism sector mainly in 3 areas
 - 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 like bifacial, thin materials and micro-hydroelectricity) and storage (advance in H2 technologies 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).
- Facilitate the citizens' involvement in energy policy: building on the concept of energy communities introduced by the Clean energy for all Europeans package, it could be desirable to define a model adapted to the energy specific characteristics of the Alpine Space.

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 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 policy support needs towards value creation through low-carbon policy implementation. Given the current challenges of tourism and energy issues in the Alpine region, this paper recommends to build on the Smart Specialisation Strategies (S3), an innovative approach that aims to stimulate growth and jobs in Europe by enabling each region to identify and develop its own competitive advantages.

3) Tourism and energy: towards a low carbon 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)¹.

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.

Numerous studies² 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

¹ <https://www.alpine-region.eu/sites/default/files/uploads/group/2266/attachments/brochure.pdf>

² Probst T, Hohmann R, Pütz M, Braunschweiger D, Kuhn Belaid R, Climate Adaptation Governance in the Alpine Space, Transnational Synthesis Report, 2020

(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 Cryosphere³ (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, resulting in a strong increase of needs for artificial snow by the 2050s. However, such an increase in snowmaking is accompanied by higher energy, financial and ecological costs.

In terms of economic and market impacts, a critical review of 119 academic publications carried out in 2019⁴, 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.

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.

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 low-carbon adaptation strategies along with measures for climate change mitigation that reduce their emissions of greenhouse gases.

³ <https://www.ipcc.ch/srocc/>

⁴ Steiger, Scott, Abegg, Pons, & Aall, Current issues in Tourism, 22:11, 2019.
<https://www.tandfonline.com/doi/full/10.1080/13683500.2017.1410110>

4) Policy aims and objectives of Smart Altitude

Given its purpose and the needs to be covered for its successful deployment, Smart Altitude project fits perfectly into the strategic objectives of the EU Strategy for the Alpine Region that aims at ensuring 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 context⁵. EUSALP identifies 4 priorities:

- 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 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. In order to achieve its full effect, the Smart Altitude approach must ultimately bring together all the stakeholders in a resort (ski lifts operators, public authorities, property managers, individual residents or visitors). Smart Altitude focuses on the management of energy policy but has a much wider potential by aiming to provide resorts with centralised supervision/management systems which are essential given the specificities of their activity (very high seasonality). This is a global approach: in addition to energy flows, the management system could in the longer term 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 stations 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

⁵ <https://www.alpine-region.eu/node/21>

for the launch of an energy transformation policy specific to the Alpine space.

To achieve these objectives, the mobilisation of the S3 framework seems particularly appropriate.

5) S3-strategies in the Alpine area

Brief description

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.



Figure 1: The S3 platform

Review of S3 strategies and energy-related priorities

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 JRC⁶ 14 regions (namely: Lower Austria, Upper Austria, Tyrol, Voralberg, 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, 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, trans-national 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.

The table below lists the S3 strategies of Alpine Regions. Energy-related issues are highlighted in green-bold.

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| Baden-Württemberg | <p>Sustainable mobility concepts: E-mobility, alternative driving systems, innovative usage concepts and networked, resource-efficient mobility. Integration of traffic systems with the help of intelligent control systems, ecological modernization of the state's vehicle fleet.</p> <p>ICT, green IT and intelligent products: Cloud computing, open source software, energy and resource efficiency, sustainable mobility and e-Health.</p> <p>Environmental technologies, renewable energies and & resource efficiency: Smarter use of scarce raw materials and energy carriers, lightweight construction, sustainable production processes in SMEs, recycling and waste management and promote the qualification of engineers and skilled workers.</p> |
| Bavaria | <p>Clean technologies</p> <p>ICT: Cyber-security, big data, cloud computing, industry 4.0, e-Commerce, craftsmanship 4.0, robotics for automation (in production, logistics and healthcare), connected mobility, e-Health,</p> |

⁶ Available at: <https://s3platform.jrc.ec.europa.eu/>

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| | digital care, precision medicine and tele-medicine, smart energy , digital media (film and gaming), e-Tourism, e-Finance, smart construction, digital agriculture for resource efficiency and transparency, e-Environment and environmental protection |
| Austria | Climate change: Rational use of energy and natural resources |
| Styria | Green Technology: Combine the development of technology with the efficient and sustainable use of natural resources (particular emphasis on the use of wood as a renewable raw material and its value chain); and with advances in the areas of "Green Energy", "Green Resources" and "Green Buildings" . |
| Salzburg | <p>Intelligent construction and settlement systems: Intelligent Alpine Building, Smart Settlement Systems (settlement 4.0), development of spaces, mobility, energy, infrastructure, social issues and demography, always aiming to safeguard minimum resource consumption, sustainable use of infrastructure, and placing human beings – the users – at the forefront.</p> <p>The Creative Economy and Service Innovation: Design and structuring: eco-design, strongly drawing upon the sustainability concept, materials research and resource efficiency. Digital, interactive media, media technologies, visualisation, animation, app programming, software programming, interfaces to the human user, programming of digital, interactive media. Service innovations for all business sectors, both in service-based and in production-based business sectors (e.g. artisans, industry, tourism, commerce). Service innovations for tourism. The goal is to further develop tourism, applying innovation and research, a strong foundation of knowledge and the e-tourism sector.</p> |
| Slovenia | <p>Smart Cities and Communities: Manufacturing of electric and electronic components and equipment, ICT systems, components and systems for district heating and the heating, ventilation and air-conditioning (HVAC) systems. Development of ICT-based projects in the areas of renewable energy sources, smart urban mobility, safety and smart health systems.</p> <p>Smart buildings and homes: Energy refurbishment of buildings, interfaces between smart buildings and smart grids, integrated management systems for buildings, homes and the working environment of the future, and smart appliances for energy efficiency and self-sufficiency of buildings. The R&I activities include also sustainability of buildings with re-use of used construction materials and of waste as well as renewable and eco-friendly and healthy materials; integration of wood-chain in the design of homes and working environments of the future by including research and innovation deriving from traditional knowledge and skills in using the wood and wood-compatible natural materials.</p> <p>Sustainable Tourism and Creative Cultural and Heritage based Services: Research and Innovation activities focusing social innovation based on rich cultural heritage and local creativity promoting activities and services centred around sustainable use of natural resources and innovative well-being programmes.</p> |
| Friuli-Venezia Giulia | ICTs and new technologies for tourism and cultural sectors and social innovation: Cross-sector innovation area: ICTs and new technologies for the tourism sector and valorisation of the cultural heritage and social innovation. New technologies for the diagnosis, recovery, management and enhancement of cultural resources. Technologies and models for the co-creation of new experiential and cognitive experiences. Digital platforms and web services for cultural promotion and social innovation. |
| Veneto | New technologies for sustainable living: Cross-sector innovation area: new technologies for sustainable buildings and cities, security and health. Well-being in living environment, smart and sustainable cities and buildings, security and health (technologies for independent and active life), cultural heritage regeneration. |

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| | <p>New technologies for the creative industries: Cross-sector innovation area: ICTs, new technologies and materials for new products and services. Innovative marketing and products' virtualisation, innovative and eco materials, creative design, technologies for cultural heritage valorisation.</p> |
| Lombardy | <p>Sustainable mobility Eco – Industry</p> |
| Autonomous province of Trento | <p>New technologies for energy and environment: Cross-sector innovation area: new technologies and solutions for sustainable natural resource management, environmental monitoring systems, sustainable buildings, renewable energy production, forest conservation and wood-products industry.</p> |
| Autonomous province of Bolzano | <p>New technologies for mountain living and production activities: Cross-sector innovation area: new technologies and solutions for the agri-food, manufacturing, tourism and construction sectors as well as for safety and sustainable mobility in mountain areas. New technologies and solutions for ski areas and outdoor activities. Medical assistance in mountain areas. Civil protection. Mobile platforms for fruits production, etc. Sustainable buildings and energy efficiency in construction, etc.</p> <p>New technologies for energy production, storage and saving: New technologies and solutions for sustainable natural resource management, environmental monitoring systems, sustainable buildings, renewable energy production, forest conservation and wood-products industry.</p> <p>Strengthening the local production system through ICTs: Producing advanced products and services related to the digital economy. Strengthening the technology transfer to companies in the following areas: cloud computing, GIS applications, intelligent mobility systems, e-tourism, flexible manufacturing, healthcare, e-commerce.</p> |
| Piedmont | <p>Mechatronics applications for consumer and industrial products: Mechatronics applications for consumer and industrial products, manufacturing processes, eco-efficiency and eco-compatibility, virtual performance simulation, mechatronics automation, human machine interface, micro and nanotechnology, manufacturing transformation.</p> |
| Valle d'Aosta | <p>ICTs and new technologies for reducing natural hazards and smart cities and communities (Smart mountain): New techniques, products and devices for the analysis and evaluation of natural hazards and smart cities and communities. Devices, sensors and solutions for monitoring natural hazard. Early warning systems and emergency management related to environmental hazards. New digital services for citizens and communities. Digital platforms and web services for cultural heritage promotion and social innovation.</p> <p>ICTs and new technologies for manufacturing, tourism and construction sectors (Excellent mountain): Cross-sector innovation area: ICTs and new technologies for manufacturing, tourism and construction sectors. New technologies, solutions and materials for high quality and customised products for outdoor activities. Technologies for specialised productions (automotive, electronics, etc.). ICT for outdoor activities (ICT application for ski-related activities, booking systems, ticketing systems, virtual reality applications, etc.)</p> <p>New technologies and solutions for sustainable production and living (Green mountain): Cross-sector innovation area: new technologies and solutions for sustainable agriculture and manufacturing productions and enhanced ecosystem services. Technologies for the agri-food industry. New construction materials and building techniques for sustainable construction. Renewable energy, energy saving systems and smart grids. Technologies for public utilities management, environmental monitoring and rehabilitation.</p> |

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| Provence-Alpes-Côte d'Azur | Energy transition and energy efficiency: Advancing on energy-efficient building renovation through improved thermal insulation, managing and securing smart electricity networks and developing the production of marine renewable energy. |
| Rhône-Alpes | Smart and energy-efficient buildings: This covers the active management of buildings, innovative materials and integrated photovoltaic solar energy. Networks and energy storage: This involves multi-scale smart networks (micro grids, smart grids and super grids) and multi-energy storage. |

Table 1: list of Regional S3 strategies highlighting energy efficiency-related measures

6) Interrelation between Smart Altitude and S3-objectives and tools

S3 tools of interest for the Smart Altitude objectives

Beyond supporting decision-makers, the S3 platform provides tools of particular interest to policymakers pursuing objectives for which Smart Altitude appears to be part of, e.g. to identify collaboration potential and funding opportunities. The most relevant tools identified are as follows:

Eye@RIS3 tool⁷

“Eye@RIS3 visualises public investment priorities for innovation across Europe. It enables public managers and stakeholders to position their territory in comparison to other territories and to find potential partners for collaboration.”

Within this tool, it is possible to filter the results by territory and by S3 objectives. The results can then be visualised on a map for identifying regions with similar goals and therefore potential interregional cooperation.

⁷ The Eye@RIS3 tool: <https://s3platform.jrc.ec.europa.eu/map>

Example of use

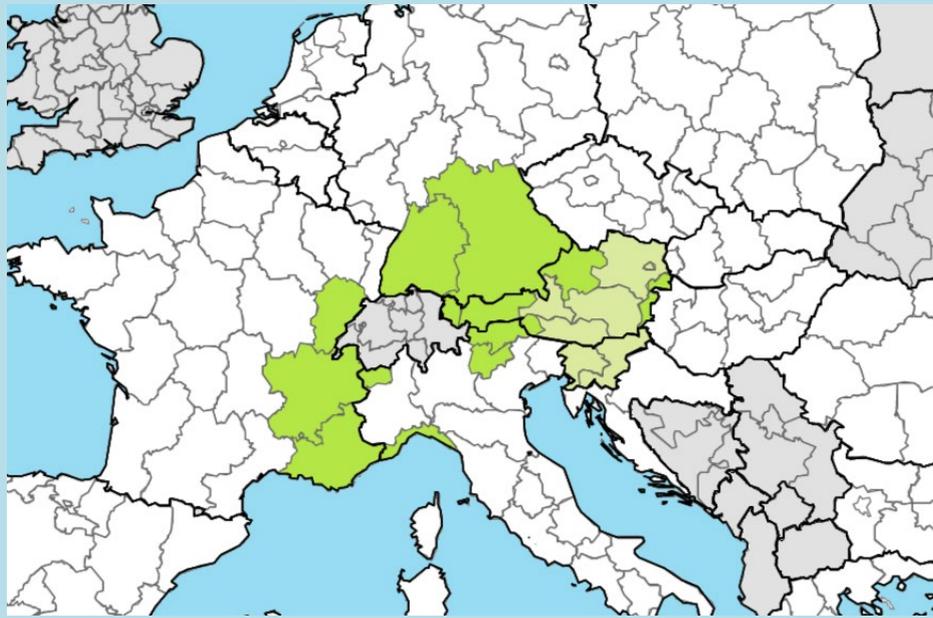
For obtaining the map below, the search was constrained to the Alpine Region (EUSALP) and to these S3 policy objectives, which match well the Smart Altitude aims and objectives:

D.22 – Cleaner environment & efficient energy networks and low energy computing

F.44 – Ecotourism

J.68 – Sustainable energy & renewables

Most regions in the Alpine space have declared at least one of these objectives as a public investment priority for innovation:



ESIF – Energy tool ⁸

“This is a tool to search within European Structural and Investment Funds (ESIF) Operational Programmes (OPs) which countries and regions plan to invest in different energy areas, due to them mentioning specific energy-related keywords in different OPs that cover the territory.”

The tool works in a similar manner than Eye@RIS3, with a search engine and a map, and helps regional policymakers to identify ESIF Operational Programmes in the energy sector.

Example of use

The activity area “Renewable Energies” belongs to the S3 objectives of Valle d’Aosta, which is a small mountainous region in the North-West of Italy. By filtering by activity area “Renewable Energies” in this region, it turns out that 56 ESIF OPs exist. Neighbouring regions in Italy and France have a roughly similar number of OPs in this activity area (36 for Rhône-Alpes and 69 for Piedmont) but are much larger regions. The topic “Renewable Energies” is therefore a topic which is worth considering in Valle d’Aosta.

⁸ The ESIF-Energy tool: <https://s3platform.jrc.ec.europa.eu/esif-energy>

Regional Benchmarking tool⁹

“A key to build sound innovation strategies for smart specialisation at the regional level is to identify opportunities for learning policy lessons and transferring practices from other regions.”

The Regional Benchmarking tool helps to identify regions that should be considered for learning policy lessons / transferring practices, because they share similar structural conditions that are relevant for innovation-driven development (social, economic, technological, institutional and geographical characteristics). However, this tool does not allow for a finer resolution by activity area, so that the relevance of this tool for specific objectives of Smart Altitude is limited. In some cases, it might be useful to identify best practice examples.

Example of use

The region that is closest to the Rhône-Alpes region in France, with respect to the above-mentioned criteria, is the Lombardy region in Italy. Therefore, policy- and decision-makers from the Rhône-Alpes region might be interested in finding similar projects in the Lombardy region, because they are more likely to have similar needs.

EU Trade tool¹⁰

The EU Trade tools helps policy-makers and stakeholders to visualize:

- Main competitors for each EU region and their rank;
- Imports and exports;
- A more detailed view of the competitiveness score for each region;
- Trade network scores;

This tool is suited for understanding macro-economic considerations between regions at a higher level. Therefore, it is less relevant for the specific purposes of Smart Altitude, i.e. energy topics in ski resorts, because it does not allow for a fine filtering by activity sector.

R&I regional viewer¹¹

“The R&I Regional Viewer (ESIF/H2020 data) is a tool to visualize and compare Research & Innovation investments under different funding channels and EU programmes across EU Regions”

This tool can be used for e.g. screening regions for organizations that have already received H2020 or ERDF grants. Combining the results of the R&I regional viewer with current calls for funding and tenders from the European Commission¹² can be a powerful approach for finding funding opportunities and the right partners for projects.

⁹ The regional benchmarking tool: <https://s3platform.jrc.ec.europa.eu/regional-benchmarking>

¹⁰ The EU trade tool: <https://s3platform.jrc.ec.europa.eu/s3-trade-tool>

¹¹ The R&I regional viewer: <https://s3platform.jrc.ec.europa.eu/synergies-tool>

¹² See e.g. the Funding & Tenders portal from the European Commission: <https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/home>

Example of use

Selecting Horizon 2020 grants in the fields of “Secure, Clean and Efficient Energy” and “Climate action, environment, resource efficiency and raw materials” for the Oberbayern region (Germany), gives a list of 144 organisations from that region that already received or were involved in grants on these topics. Refining the search then helps identifying partners that are relevant for the specific objectives related to ski resorts.

Digital Innovation Hubs¹³

This tool can be interesting for finding partners from the digital innovation sector, especially when planning solutions linked to smart grids or more generally issues related to energy management IT platforms. Of course, all the presented tools can and shall be used in a complementary way to identify collaboration potentials at regional and transregional levels and for identifying European funding opportunities.

Relevance of Smart Altitude towards S3 objectives

The Smart Altitude project is an example of how the cooperation of partners from different regions boosts innovation and the implementation of low-carbon solutions in ski resorts: The Smart Altitude Living Labs were able to develop specific solutions according to regional S3 objectives and further regional or local needs. For example, the Living Lab of Les Orres developed a smart grid system, which is in line with the S3 objective of the region Provence-Alpes-Côte-d’Azur, France¹⁴.

In Smart Altitude, the development and implementation of low-carbon solutions in the 4 Living Labs was supported by a large range of organization types: local authorities (Municipality of Les Orres, Association Européenne des Élus de Montagne), businesses (Electricité de France, RTC Krvavec), academic institutions (University of Milan, Österreichische Akademie der Wissenschaften, Fondazione Bruno Kessler) and business support organisations (BSC Kranj, Trentino Sviluppo, Steinbeis 2i GmbH, Centre de Recherches Energétiques et Municipales) from all over the Alpine region. Thereby, a broad spectrum of interests could be represented, leading to an almost inclusive governance model (lacking representatives from civil society, though).

Based on the diverse experiences of each Living Lab, Smart Altitude developed a set of generic tools¹⁵ that can be used for replicating and adapting the implemented solutions to other ski resorts, according to their specific needs. Thereby, the Smart Altitude Toolkit allows to consider the specificities of each local/regional context and at the same time to avoid duplication of efforts.

Smart Altitude also showed that an interregional cooperation with regions beyond EU borders (e.g. with the ski resort in Verbier, the Smart Altitude Living Lab in Switzerland) is possible and adds further value to the project, by providing additional experiences, perspectives and knowledge. This type of collaboration has to be fostered not only through ERDF funds, but also through regional ones.

Therefore, Smart Altitude shows that the combination of specific local/regional targets along with interregional collaborations is a functional lever for enabling and boosting low-carbon innovation in ski resorts.

¹³ The digital innovation Hubs tool: <https://s3platform.jrc.ec.europa.eu/digital-innovation-hubs-tool>

¹⁴ The S3 objectives of the region Provence-Alpes-Côte-d’Azur, France:
<https://s3platform.jrc.ec.europa.eu/regions/FR82/tags/FR82>

¹⁵ The Smart Altitude Toolkit is accessible online: <https://smartaltitude.eu/>

7) Entrepreneurship and innovation support

Beyond the S3 platform, many other organisations and instruments are of particular interest for supporting the objectives related to Smart Altitude. On one hand, it is necessary to understand to what extent existing institutions or other organisations can contribute to promote and implement the Smart Altitude objectives. On the other hand, it is of utmost importance for ski resorts to be able to make maximum use of existing knowledge and support when it comes to innovation and entrepreneurs in the larger context of sustainable development.

The following table lists organizations that can help fostering innovation in ski resorts and support their objectives. This table explains how these organisations can help to support the business of ski resorts in the larger perspective of climate change and energy transition. Major contributions from these organisations are related to the identification of potential collaboration and of funding opportunities.

Information, technical and economic resources as well as contacts can be obtained through active involvement in existing networks, working groups, clusters or sectoral associations. Financial support, or at least information on existing funding and financing schemes for supporting can be obtained from more institutional organisations. Those organisations are also often running incubators or open innovation initiatives with major academic partners or with big corporations. Such initiatives can bring huge help both on technical aspects (e.g. identifying emerging technologies which can lead to innovative products and services for increasing energy efficiency) and on more business related aspects (e.g. existing market studies, analysis of market trends, competitors analysis, Intellectual Property strategy and patenting, development of business models and business plan, commercial strategy and go-to-market action plan).

Moreover, the interaction with existing organisations significantly increases the visibility of innovators and entrepreneurs. This not only allows to get a better business network but also increases policy support and social acceptance in the mean and long terms. Existing organisations have often established and huge networks within which they are used to communicate in a very efficient and professional way. Using those communication channels significantly increases the range of the audience when innovators/entrepreneurs are willing to reach out. Also, having common activities/actions with specific organisations such as environmental NGOs is not only of interest for increasing visibility but also to increase the credibility and relevance. Indeed, having own activities/actions but working alone has less impacts and weight as working in a larger scope with recognised partners.

For more detailed information on how Smart Altitude deals with innovation, entrepreneurship and the various categories of stakeholders for the implementation of low-carbon policies in mountain resorts and tourism-intensive mountain territories, we refer the reader to deliverables D.T3.2.1¹⁶ and D.T3.3.1¹⁷.

| Organisation type | Description and examples of use |
|----------------------------|--|
| Technology clusters | <ul style="list-style-type: none"> - Identifying innovative emerging technologies for bringing them to the market. - Finding of technical and scientific partners for innovation projects (validation of technologies, testing of prototypes and demonstrators, piloting under real life condition). - Finding future business partners, suppliers or even future end users or customers. |

¹⁶ D.T3.2.1 Territorial maximisation report. <https://www.alpine-space.eu/projects/smart-altitude/results/wpt3/d.t3.2.1.pdf>

¹⁷ D.T3.3.1 Territorial stakeholder engagement report. <https://www.alpine-space.eu/projects/smart-altitude/results/wpt3/d.t3.3.1.pdf>

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|---|---|
| | <ul style="list-style-type: none"> - Finding partners for the development and implementation of new energy-saving installations, energy management systems (IT sector), etc. - Increasing the visibility of the ski resorts and related innovation needs or projects/initiatives within specific economic/industry sectors. |
| Chambers of commerce | <ul style="list-style-type: none"> - Promote and protect the financial interests of businesses of ski resorts. - Advise ski resorts on business issues related to the transition towards a low-carbon model. - Supports the creation of new companies by specific programs for young/new entrepreneur. - Dedicated working groups and networking activities which can be used to identify potential business partners, new business opportunities and market trends as well as potential customers and their specific needs. |
| Environmental charities and organisations (environmental associations acting at local and regional level, or bigger NGOs acting at national or even global levels) | <ul style="list-style-type: none"> - Raise awareness about issues related to climate change among general public, policymakers, business sector, etc. - Conduct specific projects/initiatives on a range of environmental aspects (e.g. biodiversity and ecosystem services, water preservation and sustainable management, sustainable land use and management, ...) which are directly linked with ski resort activities. - Have comprehensive knowledge and data on the state of environmental resources. - Have often excellent competencies to assess environmental impacts and good views on possible solutions to reduce impacts (e.g. though compensation initiatives). - Are a privileged channel for launching co-creation and co-development with stakeholders and the larger general public. |
| Regional development agencies | <ul style="list-style-type: none"> - Local/regional Energy and Climate Agencies provide advice and support on issues related to energy, including: - Programs and tools to assess potential for CO2 reduction, for cost savings in specific sectors. - Advise on reduction of energy consumption, energy management, renewable energies, sustainable housing, etc. - Funding initiatives for specific technologies and specific usages (e.g. energy consumption reduction in buildings) Access to specific markets (e.g. providing cost efficient heat sources to public buildings, schools, ...) |
| Funding instruments | <p>European and national funding programmes dedicated to climate change adaptation, climate change mitigation, integration of carbon-free energy production, smart grids, etc :</p> <ul style="list-style-type: none"> - The climate action innovation fund¹⁸. |

¹⁸ The climate action Innovation Fund: https://ec.europa.eu/clima/policies/innovation-fund_en

| | |
|---|--|
| | <ul style="list-style-type: none"> - Cluster 5 of the Horizon Europe funding programme (Climate, Energy and Mobility), incl. the European Innovation Council for different innovation stages. - International awards for supporting start-ups (e.g. Hello Tomorrow). - At national level: funding instruments for innovative technologies (e.g. ZIM instrument¹⁹ in Germany or i-lab program from the BPI²⁰, the one stop shop for entrepreneurs in France). - At regional level: pre-seed funding for start-up in early phases (e.g. Start-up BW ²¹in the State of Baden Württemberg in Germany) or funding for the scale-up phase (e.g. Invest BW ²²in the State of Baden Württemberg in Germany). <p>The large number of funding opportunities at EU and regional level that are related to the topics addressed by Smart Altitude shows the major interest of regional, national and EU policymakers to fund projects in these topics.</p> |
| <p>Innovation management support</p> | <ul style="list-style-type: none"> - Coordinate the action of all actors, provide support and advice on funding, write project proposals and business plans, help for finding the right project partners, and reorient for specialised advice. - This support can be offered from Regional Agencies or Chamber of commerce (see above) but is also the main mission of a range of incubators (public, private or mixt organisation). They often propose a complete program covering all aspects of bringing innovative products/services to the market. - Also, the international or national Networks for Technology Transfer are efficient entry point for innovators and entrepreneurs (e.g. EEN²³ at European level, Steinbeis foundation²⁴ in Germany) |

8) Conclusion and synthesis of recommendations

Given its objectives and nature, Smart Altitude is in line with the S3 approach and its tools for which it offers many opportunities to strengthen the entrepreneurial fabric and the innovation ecosystem in the Alpine space. Therefore, the following recommendations underline the potential and role of cross-regional R&I actions. Specifically, the Smart Altitude project recommends to:

- Promote the interaction across the different stakeholders of tourism sector in the Alpine region through the establishment of a local/regional working table to facilitate cooperation between energy, innovation clusters and professional organizations for alpine sports and tourism with their R&I organizations and alpine areas.

¹⁹ Zentrales Innovationsprogramm für den Mittelstand: <https://www.zim.de/ZIM/Navigation/DE/Home/home.html>

²⁰ Banque Publique d'Investissements (France): <https://www.bpifrance.fr/>

²¹ Start-up BW (Baden-Württemberg, Germany): <https://www.startupbw.de/>

²² Invest BW (Baden-Württemberg, Germany): <https://invest-bw.de/>

²³ Entreprise Europe Network: <https://een.ec.europa.eu/>

²⁴ The Steinbeis Foundation (Germany): <https://www.steinbeis.de/en.html>

- Promote the identification of the tourism sector as a Smart Specialisation priority for the next programming period: 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 at developing a specific chapter on S3 in Alpine regions to promote operational excellence in winter tourism destinations through concrete examples of best practices. The European context of a new programming period 2021-2027 of the FESI and also the European Green Deal, is clearly in favour of the development of an important chapter of S3 on Energy transition.
- Fast-track R&I transregional actions specific for the winter tourism sector mainly in 3 areas
 - 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 like bifacial, thin materials and micro-hydroelectricity) and storage (advance in H2 technologies 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).
- Facilitate the citizens' involvement in energy policy: building on the concept of energy communities introduced by the "Clean energy for all Europeans" package, it could be desirable to define a model 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.