

## alpS

### Centre for Climate Change Adaptation

Programm: COMET – Competence Centers for Excellent Technologies

Programmlinie: K1-Zentren

COMET subproject, duration and type of project:

Mount++, 04/2014 – 03/2017, multi-firm

## Alpbach: Future role model for competitive, sustainable and energy-optimized alpine tourism

The tourism destination of Alpbach in the Tyrol is becoming a showcase for sustainable and competitive alpine tourism. The project develops energy-efficient, ecologically sensitive and sustainable solutions for Alpbach region and its ski resort. Among the already implemented or initiated innovations are: a photovoltaic system in a high alpine setting, energy production utilizing the existing snow-making system of the ski resort, drone-based surveying and climate modelling to further improve snow management, an energy management system for the local lift company, an e-mobility concept as well as a GPS-based “energy-adventure-trail”.



### A vision of an energy- and resources-optimized tourism destination

“Mount++” paves the way for the transformation of the Tyrolean tourism destination Alpbach to an innovative “role model” for competitive and sustainable year-round alpine tourism with a high international reputation.

Central to the project is the analysis of the region’s energy demand and greenhouse gas (GHG) emission patterns as well as the potential of renewable energy sources. Furthermore, a process of developing an optimized and autonomous energy supply system is being initiated.

The data basis is built up by assessing and contrasting energy sinks and potential areas for energy and resource efficiency and renewable energy production on different spatial and temporal scales and for varying spatial entities, sectors and administrative boundaries.

Energy sinks are energy consumption and GHG emissions of all buildings within the residential

area, mobility and transport as well as the skiing and recreational areas in the mountains.

Based on the status quo assessment, possible future development scenarios are simulated. They form the basis for a decision-making process to define energetic and ecological fields of action and tailored activities.



### A tool for energy-balancing and scenario-development of tourism destinations

During the project runtime, a PostGIS geodatabase is devised to integrate, homogenize and generate the required datasets. Software modules are developed to calculate GHG emissions and energy consumption as well as ecological and carbon footprints. Due to the geo-database structure, system boundaries can be extended dynamically, and energy consumption and GHG emissions can be calculated for single entities like buildings, ski-lifts or snow groomers, the defined sub-systems “Skiing & Recreational Area”, “Mobility & Transport” and “Residential Area” or be aggregated to generate the “big picture” for the whole municipality of Alpbach.

The results are visualized with the help of the open source Geographic Information System “QGIS”.

The holistic approach of the study also integrates local stakeholders and visitors into the process of transforming Alpbach’s tourism to an energy- and resources-optimized tourism. Surveys of tourist perceptions on ecological topics are carried out and a communication concept for stakeholder involvement and increased public awareness is being developed.

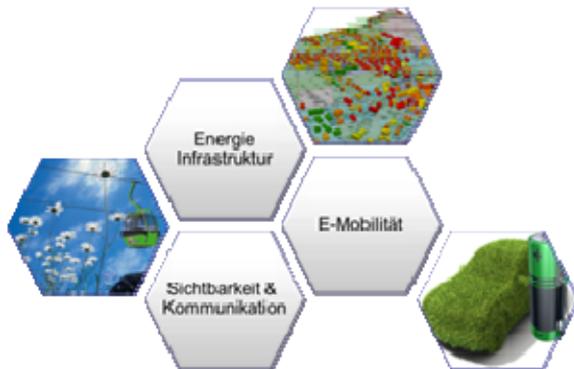


Fig. 1: Areas of interest Mount++ (© alpS GmbH)

**Impact and effects**

The “Mount++” project is a driver of innovation and already viewed as such by the business partners involved. Various scientific sub-projects are currently forming the Alpbach into an open-air research lab. The expected R&D results will provide the business partners, as well as the alpS competence center, with a significant added value. The following concrete project results should be highlighted:  
 The construction of a high-mountain photovoltaic system for research purposes in a ski area, including a second photovoltaic system in the valley for comparison, is underway. An innovative concept is being developed to use the snowmaking system as a small power

plant in the summer. The existing snow management system will be further developed to create a new prediction model for predicting ideal snow dates and snow quantities as well as water and energy consumption levels. A precise digital 3D model of the ski area that is necessary for snow management and small-scale climate modelling has been produced-both ecologically and economically efficiently- by means of a drone. Further initiatives, such as in the field of e-mobility, or the development of an "outdoor energy adventure trail" as an innovative mobile app to raise awareness and promote conservation of energy resources, will follow



Fig. 2: High alpine Photovoltaic system (© alpS GmbH)

With the know-how generated in Mount ++, alpS has the tools to aid the Tyrolean tourist communities along their way to becoming more sustainable, innovative and energy-efficient. This added value is not only beneficial to alpS as a consulting institution and its project partners, but to the entire Tyrolean tourism industry.

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Universität Innsbruck	Austria

Further information on COMET – Competence Centers for Excellent Technologies: [www.ffg.at/comet](http://www.ffg.at/comet)  
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