

## **BACKGROUND PAPER** // DECEMBER 2018 **Green Economy in the Alps**



German Environment Agency

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Matterhorn with Stellisee in Valais Alps (Switzerland).

### **Table of contents**

1	The Alpine region	6
2	Instruments for a sustainable Alpine policy	7
3	Green economy in the Alps	9
	TOPIC AREA 1   Low-carbon economy and climate adaptation	0
	TOPIC AREA 2 Resource-efficient economy	1
	TOPIC AREA 3   Ecosystem services and natural capital	2
	TOPIC AREA 4 Quality of life and well-being	3
4	The Alps as a model region	4

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### **1** The Alpine region

The Alpine region comprises more than eight countries, is the place of residence of nearly 14 million people and is visited by millions of tourists every year. With almost 200.000 km<sup>2</sup> this region is the largest natural and cultural area in Central Europe. Rivers such as the Rhone, Rhine and Po have their sources here equally as the main tributaries of the river Danube. The metropolitan areas of Munich, Milano and Zurich - to name but a few - surrounding the region cause a high demand for Alpine natural goods and recreation areas. On the one hand, the population of the Alpine region lives concentrated in valleys and cities with a high density of population and rising numbers of inhabitants due to the limited habitable areas caused by its specific topography. On the other hand, the region is marked by migration in remote and peripheral areas (PSAC 2014). That is why the aim for a sustainable spatial development is one of the main subjects for the Alpine area.

The specific environmental conditions of a high mountain region characterize the Alpine region. Due to its climatic conditions, its soil and water balance, its biodiversity and availability of land this region is more sensitive than regions in the lowland. The Alpine region is especially vulnerable to climate change. The temperature rises here twice as fast as on the worldwide average (EEA 2009). Latest evaluations of perennial climate observations carried out by the German Meteorological Service show that the average air temperature for the German part of the Alps has increased by 1.3 °C in the period between 1881 and 2016 (BMVI 2018a). Also measurements made in the other Alpine countries show a strong warming up.

The rising temperature causes melting of the Alpine glaciers. In the Bavarian Alps, there are still five glaciers. Three quarters of the Bavarian glacier masses have already melted during the past 200 years and it might be possible that in the next 20 years four of the five German glaciers will have disappeared completely (StMUV 2009). According to the Bavarian Academy of Sciences, the shrinkage of areas has varied between 87 % at the southern Schneeferner and 28 % at the Höllentalferner (BMVI 2018b) in the period between 1949/50 and 2014/15.

Due to climate change, frost and ice days will immensely decline in the German Alpine region. However, the extremes connected with heat will increase, such as the duration of heat periods and extremely warm days. Warming up will result in a shifting of the altitudinal vegetation zones. Thus, about 20% of the Alpine plants, such as aster alpine or snow gentian, will meet a strong competitive pressure; yet subalpine plants may extend their spreading area (Rumpf et al. 2018). In addition, the warming above average will have especially high effects in the fields of biological diversity, water management, construction, transport, tourism as well as industry and commerce (UBA 2017).



Southern Schneeferner in August 2018.

### **2 Instruments for a sustainable Alpine policy**

In regards to the special vulnerability of this region and to the global challenge of climate change, an ambitious environmental and climate protection policy is the key to a sustainable development of the Alpine region. An important step to a sustainable development of the region is the signing of the Alpine Convention by the eight Alpine states (Austria, France, Germany, Italy, Liechtenstein, Monaco, Slovenia, and Switzerland) and the EU in 1991. It is the worldwide first binding Convention under international law for the protection of a mountain region. Thus, for the first time a transnational mountain area has been recognized as a geographic unit and a cultural and economic region facing common challenges.

The protocols of the Alpine Convention deal with the central environmental subjects of the region. These are completed by joint declarations and statements of the ministers for the environment of the Alpine countries where further subjects of cooperation are defined. The following list contains the protocols and declarations of the Alpine Convention:

## Protocols and declarations of the Alpine Convention:

- Declaration on Climate Change
- Declaration on Population and Culture
- Statement on Strengthening of Sustainable Economy in the Alps
- Protocol on Energy
- Protocol on Nature Protection and Landscape Conservation
- Protocol on Mountain Farming
- Protocol on Mountain Forests
- Protocol on Soil Conservation
- Protocol on Spatial Planning and Sustainable Development
- Protocol on Tourism
- Protocol on Transport

Figure 1



Survey of the defined areas of the Alpine Convention, EUSALP and the Alpine Space Programme

Source: EUSALP 2015

A prominent example of the impact of the Alpine Convention is the Protocol on Transport, which i.a. regulates the prohibition of new large-capacity roads for the Alpine transit traffic. As a reaction on the efforts to build a new motorway between Venice and Munich, the contracting parties of the Alpine Convention repeatedly clearly opposed to new Alpine motorways (PSAC 2018) at the meeting of the Permanent Committee in June 2018. However, the Alpine Convention acts, in general, as a "framework creating" political instrument with international cooperation and collaboration between the contracting parties being of top priority and aimed at solutions prepared jointly on environmental protection and sustainability subjects of the Alpine region. One element of the Convention gaining more importance is the partnership approach, which recommends an intensified cooperation between local, national and international levels. This approach is also defined in the multiannual work programme of the Alpine Convention (MAP) 2017 -2022. The aim of the partnerships is to increase the effectiveness of the Alpine Convention on regional and local levels. Thereby, the cooperation between the contracting parties of the Alpine Convention and the Alpine networks, such as the International Commission for the Protection of the Alps (CIPRA), the Alpine Town of the Year Association, the network of municipalities Alliance in the Alps and the Alpine Network of Protected Areas (ALPARC), play a major part for the effective implementation of the Alpine Convention.

Since 2015 the macro-regional EU Strategy for the Alpine region (*EUSALP*) has been applied. The Alpine Space Strategy refers to seven states and 48 regions of these states. Thereby, it concentrates on the priorities of economic growth and innovation, mobility and connection as well as environment and energy. In contrast with the Alpine Convention, the (sustainable) economic development is of particular importance in EUSALP. In addition, EUSALP includes also economic regions outside the mountainous region of the Alps. Whereas the Alpine Convention comprises in Germany e.g. only Bavarian rural districts in the Alpine and pre-Alpine regions, the perimeter of EUSALP goes far beyond that (see Figure 1) including also metropolitan regions far in the north of the Alps.

A third element of the transnational cooperation in the Alpine region is the European Territorial Cooperation Programme for the Alpine Space (*Alpine Space Programme*). Altogether 57 projects on sustainable development in the Alpine region were promoted in the first funding period 2007–2013. Until 2020, €116.6 million in EU founds will be made available for further transnational projects. Currently, the further development of the Alpine Space Programme for the period after 2020 is not yet clear.

### **3 Green economy in the Alps**

UN Environment (UNEP 2011) defines a green economy as one that results in "improved human wellbeing and social equity, while significantly reducing environmental risks and ecological scarcities. In its simplest expression, a green economy is low-carbon, resource efficient, and socially inclusive". It is a type of economic activity, which may contribute to coping with challenges such as climate change and environmental pollution, yet also the progressive demographic change and migration from rural areas. At the same time, it may secure income and quality of life on the long term as well as create jobs for the inhabitants of the Alps. The example of the Achental (Germany) shows how the green economy concept may be used as driving force for a future-oriented regional development. The valley in southern Chiemgau impresses not only due to its extraordinary landscape but also because of the consequent and engaged implementation of a sustainable development idea. The future of the valley did not look good in the late nineties: Dying of farms has been threatening, young people moved away, the number of overnight stays declined. Today, a success story evolved thanks to the establishment and development of the so-called "Ökomodell Achental". The basic idea is quite simple: Marketing the remoteness and stillness of the valley for tourism, adapting agriculture to ecological standards, producing as many regional products as possible and using the overabundant offer of wood, i.a. with its bioenergy. Many actors in the region cooperate today for a successful and sustainable future.



Overlooking the Achental in Bavaria, Germany.

Just like the Achental, the whole Alpine region offers a considerable potential for developing a green economy. The impressive landscapes, the rich Alpine natural goods and the sensitive environment support a high awareness for ecological boundaries. The natural resources, the climate and the emerging climate change, the specific topography and the sensitive Alpine environment have to be considered for the development of a green economy. Thereby, important factors are the limited availability of areas with a moderate slope inclination available for construction, the increasing transport in the valleys (air pollution) and the role as transit region between Northern and Southern Europe. Due to their limited accessibility, peripheral areas show structural restrictions, like market barriers for small or new enterprises and a restricted supply of consumers. These conditions require integrative sustainable development approaches for the whole region with the development of a green economy contributing to it.

The actual state and the development of the green economy in the Alpine region were compiled and described in detail in the Report on the State of the Alps (PSAC 2016a), which was elaborated in cooperation with experts from the Alpine states under the chair of the German Environmental Agency. In the following, key messages of the report are presented in an overview, focussing on four topic areas. The key messages are supplemented by current information from relevant projects of the German Environment Agency. The complete sixth Report on the State of the Alps is available *here*.

#### **TOPIC AREA 1**

#### Low-carbon economy and climate adaptation

The adaptation to the consequences of climate change and the transformation towards a lowcarbon economy are especially important elements of the sustainability policy in the Alpine region due to its vulnerability. In 2016, the ministers for the environment of the Alpine countries agreed on the vision of a climate-neutral Alpine region until 2050 (PSAC 2016b) and established the Alpine Climate Board. At the XV Alpine Conference in 2019, the board will present the draft of a climate target system for reaching this vision. The sixth Report on the State of the Alps states that the progress of individual Alpine countries to achieve climate goals differs greatly from country to country. As the Alpine countries still have high but declining CO<sub>2</sub> emissions, there will be a high demand for additional climate mitigation measures also in future. One of the greatest challenges of this topic area is the urgent need for adaptation to the consequences of climate change (comp. Chapter 1) as well as the short time remaining for policy action.

UBA addresses the subject of climate adaptation in the EU Interreg project *Go Apply* within the framework of the Alpine Space Programme. The project's goal is paying a contribution for the implementation of climate adaptation strategies and action plans in the Alpine countries. The project analyses climate adaptation governance from a transnational perspective: vertically between political levels and horizontally across sectors and fields of action. Moreover, the project develops recommendations for action. In addition, the capacity of adaptation of non-governmental actors will be strengthened by analysing and testing participatory activities together with practice partners. UBA is one of the five project partners. The project is coordinated by the Environment Agency Austria.

#### TOPIC AREA 2 Resource-efficient economy

An efficient use of natural resources is essential due to their limitation. Yet, their unsustainable use has globally increased during the last decades with remarkable negative effects on the environment and human well-being. All Alpine countries want to increase its resource efficiency, i. a. by developing its circular economies. The sixth Report on the State of the Alps confirms that they were able to improve their resource productivity in the period between 2005 and 2014. Further measures to increase the efficiency are absolutely required because of the high resource consumption of the Alpine economies.

Water and forest are especially important resources for the Alpine region. The respective protocols of the Alpine Convention and the expert bodies established for this purpose concentrate on the sustainable use of these resources. Soil and land degradation receives increasing attention, as it still continues, in spite of a respective protocol of the Alpine Convention and some national measures being taken (see example in Figure 2). The establishment of an expert body dealing with this subject within the framework of the Alpine Convention is currently under discussion. In preparation for this, the Protocol on Soil Protection of the Alpine Convention has been checked for its efficiency, application and familiarity at an expert meeting of UBA in 2016.<sup>1</sup>

In addition, UBA is active as an observer in the Alpine region in the EU Interreg project *Link4Soils* for the subject of soil protection in the framework of the Alpine Space Programme. The targets of the project are to establish a soil partnership between the Alpine states, to strengthen the information sources for soil management in the Alpine region, to collect practical examples for the preservation of soil and ecosystem services<sup>2</sup> as well as raising awareness and transferring know-how.

1 Results of the expert meeting see: http://www.umweltbundesamt.de/publikationen/ quo-vadis-bodenschutz-in-den-alpen-bilanzierung-des.

Économy, social service and human well-being in the Alps are directly and indirectly based on goods and services provided by nature. These goods and services are called ecosystem services. For example: Mountain forests provide regulatory services for protection against natural hazards such as floods, avalanches and mudflows.

#### Figure 2

**Example for land use changes in the area of the German part of the Alpine Convention** The figure shows how the use of land has changed to the benefit of settlement and infrastructure in the period between 1992 and 2013.



Source: PSAC 2016a

#### **TOPIC AREA 3**

#### **Ecosystem services and natural capital**

The natural capital and ecosystem services form the basis for economic activities and human well-being. The Alps are considered as "water tower" of Europe as many important European rivers have their sources here. In addition, their area consists by 46% of forest. They supply wood as a renewable energy source and construction material, protect the soil and regulate the microclimate. The large natural landscapes provide space not only for multifarious plants and animals, but they serve also for the recreation of millions of visitors every year. Protected areas of different categories have been set up to protect the unique natural capital (see Figure 3). Yet, establishing protected areas is only one component of the measures required for the comprehensive conservation of the ecosystem services and the biodiversity in the Alps. It is also important to link the areas to ecological corridors to ensure the genetic exchange among populations.

The development of markets for sustainably produced goods and services based on Alpine ecosystem services and biodiversity could be a possibility to support the protection of species, preservation of habitats and cultural areas grown over centuries through a green economy approach. Thus, already today farms in the Alps produce e.g. "flowering meadow seeds" for greening areas at roadsides. A further option is the long-term compensation of ecosystem services. However, the assessments of natural capital and ecosystem services are still insufficient to comprehensively design and to use these instruments.

#### Figure 3



Large protected areas (> 100 ha) in the area of the Alpine Convention

Source: Alparc 2016

#### TOPIC AREA 4 Quality of life and well-being

The sixth Report on the State of the Alps points out the positive effects of a sustainable transformation of the economy for employment in the topic area of quality of life and well-being. To name one example, about 2.2 million persons were employed in environmental protection in 2012 in Germany (Edler & Blazejczak 2016). This corresponds to 5.2 % of all employees, thus making environmental protection an important sector of the labour market. Qualification measures, the promotion of small and medium-sized enterprises and regional value chains as well as the promotion of sustainable innovations may increase these effects.

Also the improvement of health is decisive for the quality of life, e.g. by reducing the emission of pollutants in and at the edge of the Alps. Figure 4 shows that the European target value for particulate matter is exceeded in several measuring stations for urban and suburban background values in the Italian part of the Alpine Convention perimeter. Scientific issues in the system of atmosphere, biosphere, hydrosphere and cryosphere and potential effects of environmental impacts on health or on economic activities (such as tourism) may be comprehensively answered by global atmospheric monitoring. UBA contributes to it with a research station at the Schneefernerhaus. This research station is part of a network of Alpine research stations in high altitude from Germany, Austria, Switzerland, Italy and France for the integrated environment observation, called Virtual Alpine Observatory (VAO). As climate change has particular strong effects on the sensitive Alpine region and the Alps affect the natural balance decisively, the issues of Alpine water balance, Alpine environment and atmospheric trends are addressed in the framework of this scientific network.

Moreover, a sustainable management of the Alpine tourism may contribute to a better well-being in the region. The attractive design of tourism offers out of the main winter season is part of it, as well as climate-friendly hotels and food from regional or

#### Figure 4



Source: PSAC 2016a, data source: EEA 2016

ecological agriculture. Equally important is the offer of an environmental-friendly mobility – in the region of destinations as well as to individual touristic activities. The networks of Mountaineering Villages (*Bergsteigerdörfer*) and the *Alpine Pearls* are outstanding examples for the ambitious provision of sustainable tourism activities. These are networks of vacation destinations promoting a sustainable tourism in the Alps in an exemplary way.



Research station Schneefernerhaus at the Zugspitze, Germany.

### 4 The Alps as a model region

Due to its special regional conditions, the Alpine area is not only regarded as an open air laboratory and early warning system for climate change, but it may also be developed into a green economy model region. In addition, the Alpine countries may act as pioneers. Currently, here can be referred to the failed EU Soil Framework Directive. This gap is taken up by the actors from the Alpine region by trying to position the Alpine Convention as an innovative network in soil protection. An example of this is the abovementioned Links4Soil project and the consideration to establish a working group for the subject of soil protection in the framework of the Alpine Convention. Such transnational initiatives have the potential to pay a contribution to current and up-coming processes of sustainability policies on EU level. It could be worthwhile throwing a look at the experiences gathered in the Alpine region for implementing the agenda 2030 for a sustainable development and their sustainability targets on EU level and the preparation of the 8th EU Environment Action Programme (EAP), which is to enter into force in 2020.

With the Statement of the XIVth Alpine Conference on the Strengthening of Sustainable Economy in the Alps held in Grassau in 2016, the contracting parties of the Alpine Convention formulated their vision of a climate-neutral Alpine region until 2050. According to the will of the ministers of the environment of the Alpine countries, the region shall become a model region for sustainable economy and climateneutrality in Europe by greening the economy and fighting against climate change within the framework of the Multi-Annual Work Programme of the Alpine Convention (MAP 2017-2020). In order to support the transformation process required for that and to define the necessary steps, a climate target system and a green economy action programme will be presented at the next Alpine Conference in Innsbruck in April 2019. The coordinated and engaged implementation of these plans by the contracting parties of the Alpine Convention and their observers will be decisive for the protection and the sustainable development of this unique region in Europe.

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