

## **Update to the Declaration on the Necessity of a More Sustainable Snow Production, last change added November 2010, Vienna, Austria**

### **Background**

We, the participants of EGU special sessions in 2009 and 2010 and in a series of TTL workshop on sustainable snow production during 2009/10 having debates on some of the most topical issues on artificial snow production, recognized that the manmade (= technical, artificial) snow making became crucial, especially to mountain regions that live on winter tourism. In particular, during the last two decades it is widely employed there to compensate for lacking natural snow. Most prominent example in Europe is the Alps, but manmade snow is nowadays used wherever skiing is undertaken and snow cover periods are shrinking.

Following points were included in consideration:

- The impacts of climate change pose a challenge for economies being highly dependent on skiing tourism
- Sustainable water and other resource use is required including intelligent energy use and more widespread use of renewable energy systems due to the goals of sustainable development and climate change mitigation;
- Higher quality snow production;
- New ways of snow production.

Global warming reduces the availability of natural snow as well as increases snowmelt. As a consequence, the demand for snow production will increase. But, as current snowmaking technology is considerably less energy efficient at temperatures near the operational thresholds than when producing snow at optimal temperatures and as the number of optimal snowmaking hours will also decrease, energy consumption is likely to increase disproportionately to snow demand.

Considering that energy prices are more likely to substantially increase than to stay at current levels the next decades, energy consumption is an issue with growing relevance to the ski businesses. Increasing costs will impact the profitability of winter tourism industry and the operation of some ski areas might become uneconomic.

A further point of consideration is snow quality. Currently produced artificial snow differs considerably from the natural snow cover, affecting environment not prepared to this difference. Some countries, e.g. the U.S. consider cloud seeding as an appropriate mean in many situations where water is important. This method is currently forbidden in Europe despite the literature proposes that this method is more resource concerned than current ways of artificial snow production. In addition this would allow the production of higher quality snow as crystal forms like dendrites - usually only found in new light snow - are lacking in current artificial snow. We generally know too little about it but should nevertheless investigate into this method. Colleagues from US and Russia are available to share their experience with the snow dependent industries. Another controversial point of possible manmade snow production is experiments with micro organism that can have an impact on the melting point of snow. Products like SNOWMAX using micro organism are known, but did not succeed to convince a broader public in Europe. Other products might be on the way, but cannot yet be judged from environment point of view. We encourage and support the following Principles and Policies for enhancing EU policy through the countries for protection the environment and human health, underlined the key role of high mountains for the human beings' existence.

### **Principles**

Artificial snow has to be produced - at least to 20% percent, but better more - from renewable energy sources as proposed by the EU Directive 2008 (wind, photovoltaic, geothermic and others) with regard to renewable energy sources. This will in particular support European mitigation issues.

It is not feasible to further adapt to climate with an increased greenhouse gas emission input. Any extension of artificial snow production has to complement by

efficiency increases of the technologies employed. Projects related to a more efficient manmade snow production have to be included.

( [http://ec.europa.eu/energy/intelligent/index\\_en.html](http://ec.europa.eu/energy/intelligent/index_en.html) )

The legal framework for artificial snow production should be stable and equitable.

Modern and innovative technologies for artificial snow producing should be used.

Cooperation should comply with the best environmental and social practices, public disclosure and dialogue with various stakeholders at all levels.

The key principles formulated in this declaration are an important instrument for enhancing of environment and human security across the European continent.

### **Policies**

Larger strategies to support the winter tourist industries and snow dependent residents in an environmentally friendly way are needed.

Promotion the aims of the EU Water Framework Directive 2000/60 and prohibit that the state of water resources is deteriorating in mountain areas.

Manmade snow has to become part of national, regional and local climate adaptation strategies.

Mutually beneficial partnerships between all interested parties/stakeholders for sustainable snow production should be encouraged by the governing instruments.

Enter into legally contracted commitments between all interested parties and pursuit of all legal remedies.

In a view of the trends in the climate change, the environmental condition and the current practice in the artificial snow production sector, respectively, we conclude: Sound artificial snow production policies should stimulate an enhanced private sector role.

A more sustainable snow production is needed. The major concerns of producers namely to prolong and extend the snow period, and the public to exclude risks for the environment have to be combined in a more resource concerned way.

Special attention should be paid to water and energy resources protection.

The research involving aspects like climate change, hydrology, the effects on nature/vegetation, erosion, human etc. subjects are needed.

These ambitious aims have to be achieved by close cooperation between practitioners - local residents and tourists, and scientists covering very different fields of expertise are needed.

Thereby information about challenges and risks has to be open to the public at a very early stage.

The Participants stressed the geographical importance of mountains and importance of maintaining a regular exchange of views, knowledge and experience on the issues based on the EGU Assemblies 2009 and 2010. In this regard we support the realization of all projects that aim at investigating the balance between artificial snow production and sustainable usage of high mountains resources.

Continuation planned for April 7<sup>th</sup>, 2011