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EGU Session HS 5.9:
Hydrological,
Ecological,
Geomorphic and
Economic Implications of
Mountain Resort Development.

WATER DEMAND FOR SKI RESORT DEVELOPMENT IN THE AUSTRIAN ALPS: Potential to save water with dendrite generator (DG) technology.

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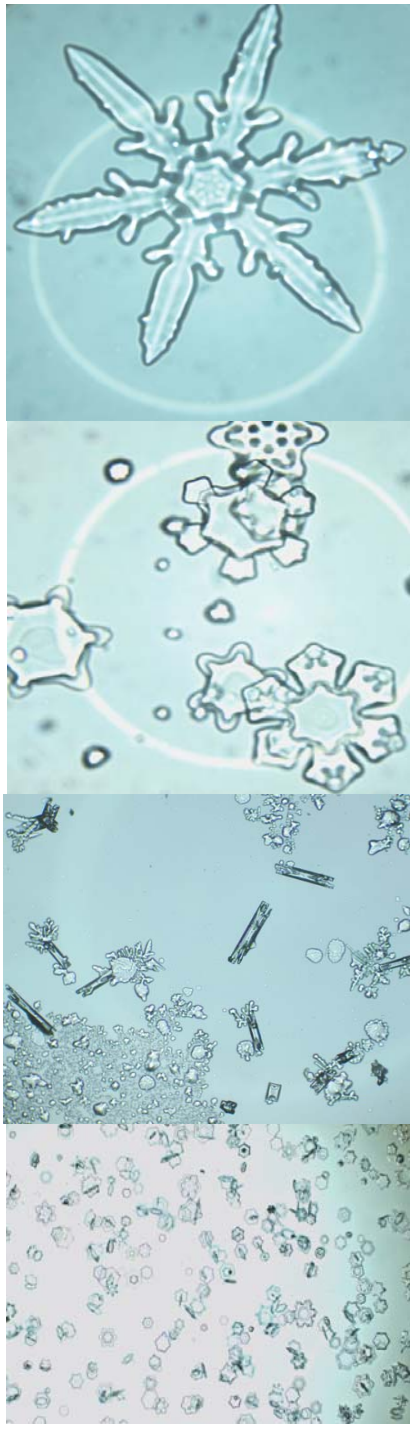
Part of kli.en project 829757 "SNOW Schneekristallbildung in einer künstlichen Wolke zum Einsatz als Schneeerzeuger"



- In 2010/11 there were more than 62 million overnight stays and 51.2 million skier-days consumed in Austria. 588 million transports were carried out by more than 3000 lifts (cable cars, chair lifts and T-bars). Including indirect and induced effects, this resulted in more than 10 billion euros in added value being generated or 3.4% of GNP.
- Austria has a skiing area of 25,400 hectares – around 17,000 hectares at altitudes between 600m and 3200m are currently suitable for snowmaking. An average value for the production is 6000 cubic metres of artificial snow per hectare per season. As much as 70% of the snow is produced immediately before the start of the season. This results in around 100 million cubic metres of artificial snow to cover a slope area of 17,000 hectares that would be produced using 57 million cubic metres of water (including losses). In winter, Austrian skiing areas use almost as much water as the capital city of Vienna.
- Thereby the irrigation pattern of Austrian land use changed significantly. Previously maize fields and low lands in summer were the most important irrigated land, now high altitude mountain areas and winter are the largest irrigated land areas. Often water demand and water supply patterns do not match.
- The water demand could again be reduced up to 30% by snow making with help of the dendrite generator, a recent innovation that has not entered the market yet. Water savings also affect the energy requirements where savings of up to 40% are predicted and leads to improved resource use, greater ecological compatibility and an increase in profitability.
  On the left of the poster you see different crystal forms produced with the DG at the cold laboratory of BOKU in dependence of the temperature ranging from -15°C to -1°C. Instead of producing icy snow with volumes of some 400kg, we produce fluffy snow with 100kg or less per cubic meter. The dendrite generator is able to produce a unique quality of snow. New applications in winter sports will be possible.
- The efficiency of performance depends on the spot and is different in each of the 350 Austrian ski resorts. There are variations in altitude, variations in time depending on the season, month and time of the day. In comparison to technologies based on wet bulp temperature, the DG produces in a container. Some environmental effects like storms are less severe.