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Water demand for ski resort development in the Austrian Alps: an Overview

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Austria has the highest national added value from winter tourism in Europe, as well as worldwide. 15.7 million arrivals were counted in Austrian accommodation establishments in the 2010/11 winter season. There were more than 62 million overnight stays and 51.2 million skier-days were consumed. 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.

The lack of snow in many Austrian skiing areas during the 2006/2007 winter season demonstrated the extent to which meteorological conditions influence operations. Declines in the number of skiers transported and total skier days were the result. The cable-car operators also had to struggle with little snow in the 2010/2011 winter. The Austrian Cable Car Operators' Association stated that the opening of 70–80% of all skiing areas outside of the peak season could only be assured through the use of snowmaking equipment. The central criterion for winter sports enthusiasts to make a trip is the guarantee that they will find snow at their destination and Austria's cable-car operators invest more than 100 million euros in the erection and improvement of snowmaking complexes every year to satisfy this demand. In the 2010/2011 season, this provided for 17,800 jobs.

Cable car operators set up snowmaking equipment to become independent from meteorological conditions and improve the capacity utilisation of their expensive investments in transport systems in the early winter. Austria has a skiing area of around 25,400 hectares – around 17,000 hectares at altitudes between 600m and 3200m are currently suitable for snowmaking. As much as 70% of the snow is produced immediately before the start of the season.

This recent trend is responsible that the irrigation pattern of Austrian land use changed significantly in the last decade. 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 areas. We assume the production of 6000 cubic metres of artificial snow per hectare per 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 during the same period.

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.