

For the environment

ENERGY EFFICIENCY IN WINTER SPORTS

Slope and fleet management with snow depth measurement

In order to offer the best prepared slopes for customers every day, Jungfrau Railways invests millions annually in snowmaking systems and snow groomers. At the same time, they focus on energy efficiency. Among others, the Pistenbully E+ with diesel-electric drive is used here, which is far more environmentally friendly and uses less fuel. High costs are constantly optimised with highly efficient snow makers. With the SnowSat slope and fleet management system, the technical snow making can be optimised and resources protected thanks to snow depth measurement. The system, from the company Kässbohrer, determines the exact position of the piste vehicle in the ski area by means of satellites. Using the position and the known terrain model beneath the snow, the exact depth of the snow under the vehicle can be calculated. The current data is displayed directly to the driver via a screen in the vehicle. In this way, he knows where and how much snow there is at any given time, he can optimally distribute this over the slope and manage the snow deposits better. This results in an optimisation of the technical pruning and protection of the resources. The potential savings are approximately 15 to 25 per cent. The system also achieves an even better slope quality. The device makes navigation easier for the driver and warns of obstacles when there is poor visibility.

«Our snow groomers are equipped with a new SnowSat tool. This is a snow depth measuring system that efficiently uses energy and resources. With the same amount of energy, better slope ratios can be achieved, time saved and expensive artificial snow can be better used. We make every effort to use the machines as efficiently as possible on a daily basis. This requires proper planning, in order that the right time can be set for the operation and the vehicles can be reliably maintained.»

Benjamin Wenger, technical maintenance worker, Jungfrau Railways snow groomer garage

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«All of our ski slopes are checked daily in the early morning. We perform these checks with skiers whenever possible and only use the snow bike in emergencies. This is different for rescues. We use snow bikes in this case. With 400 to 500 accidents per ski season, a different type of rescue would be inconceivable.»

Hansruedi Burgener, head of the Avalanche, Piste and Rescue Service, Jungfrau Railways

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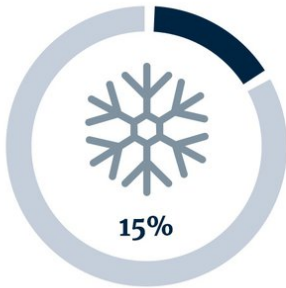
Protection against land damage

Every day, SnowSat records the depth of the snow cover and vehicle data such as fuel consumption, engine data and tracks, and it saves this for later evaluation. Knowledge about the snow cover prevents land damage. At the end of the season, the areas can be precisely cleared of snow to the very last centimetre, in order to create optimal conditions for the development of the vegetation as soon as possible.



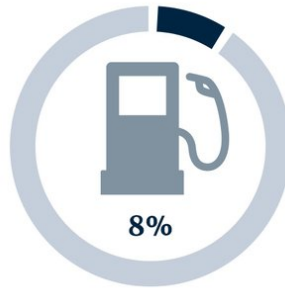
Pistenbully E+ with diesel-electric drive

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Snow production

15% less man-made snow
 Snow produced only as needed
 Real-time display of snow depth in the vehicle
 Accuracy of snow depth measurement to within
 +/- 3 cm



Fuel

8% less fuel consumption
 Saving thanks to optimized routes and more
 economical driving
 Real-time display of tracks taken



Time saving

5% less operating time
 Reduction through analysis and optimization of
 operating tasks

Advantages of the SnowSat system