JUNGFRAU
TOP OF EUROPE

JUNGFRAUBAHN HOLDING AG

OUR RESPONSIBILITY 2016

Part 3: For the environment

Table of contents

TABLE OF CONTENTS

FOR THE ENVIRONMENT

For the environment

PRINCIPLE

A pristine environment and nature are of great importance to Jungfrau Railways. It therefore attaches great importance to behaving in an environmentally conscious and nature-friendly manner in its daily work and the implementation of its projects.

«We try to make every project as environmentally friendly as possible and to minimise the environmental impact, causing as little disruption as possible to wildlife areas. We keep the construction time to a minimum by optimising our processes. We focus on minimising noise emissions and using machines with the latest technologies, such as particle filters. We also take the environment into consideration during maintenance and modification work. We install LED lights and, as far as possible, make modifications according to the latest Minergie standards.»

Thomas von Niederhäusern, Infrastructure Department, Jungfrau Railways

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For the environment

Thomas von Niederhäusern, Infrastructure Department, Jungfrau Railways

For the environment

BAN ON HELICOPTER TRANSPORTS

Whenever possible, Jungfrau Railways does without helicopter flights for its construction projects or transport services. This also applies to the restoration of retaining walls, reconstruction works on avalanche galleries and further buildings along the railway tracks.

Helicopter flights are forgone primarily due to the company's environmental policy. Noise or the impact of air bumps in the area of construction sites and their surroundings are other reasons against the use of helicopters. They are used where there is no railway connection or the transport goods are not suited to railway transport due to their nature or size.

New construction of Pavilion Restaurant Harder Kulm

Thanks to a transport cableway, it was possible, and remains possible, to do without helicopter flights for the new construction of the «Pavilion Restaurant Harder Kulm». It was installed together with the Unterseen Civic Community, which uses the same track for logging in lower Harder. The required helicopter flights can thus be reduced from 2,500 rotations to a maximum of 120 rotations. This corresponds to nearly five per cent of the usual number and relates to flights for the transport of prefabricated carpentry elements as well as larger components, such as ventilation and air conditioning systems, which are not suitable for cableway transport.

Harder Kulm transport cableway

SnowpenAir concert Kleine Scheidegg

When you travel to SnowpenAir, it's by train. This also applies to the bands – from the local opening bands to the international headline acts. In addition, the 50 to 60 tonnes of material for stages, barriers, toilets, etc. are only transported by train from Grindelwald Grund to Kleine Scheidegg and from there by snow groomers to the festival area. The preservation of the environment takes precedence over the logistical requirements that railway transport entails.

For the environment

Lauberhorn Ski Races

The spectators and most of the material at the International Lauberhorn Ski Races are taken to their destinations by train. Some 1,946 tonnes were transported by the Wengernalp Railway for the Lauberhorn Ski Races in 2016. The following comparisons show the central importance transport by train:

Helicopters instead of trains:
If only helicopters were used for all transport instead of trains, 2000 flights would have to be made.

Trucks instead of trains:
In order to provide the material transports for the Lauberhorn Ski Races with trucks, 78 trips with fully loaded 40-tonne trucks would be required. This comparison is purely theoretical, especially since transport by truck to the car-free village of Wengen would not be possible.

Lauberhorn Ski Races goods transport with Wengernalp Railway

For the environment

REPLACEMENT MEASURES IN THE FIELD OF CONSTRUCTION & INFRASTRUCTURE

Why are replacement measures necessary? In Switzerland, all major construction projects must undergo an environmental impact assessment prior to approval. Among other things, this assesses whether sensitive vegetation types or rare animals are affected by the construction. In its construction projects, Jungfrau Railways places the greatest importance on nature and the surrounding areas. If there is any impairment, however, appropriate «replacement measures» are provided in the immediate vicinity as compensation.

Jungfrau Railway Group	Replacement measures in 2016
Harderbahn AG	Reforestation for the new construction of the Harder Pavilion of around 140 m^2 on the land of the Unterseen municipality as well as 800 m^2 on the land of the Ringgenberg municipality
Wengernalpbahn AG	Extension of the Rohrfluh crossing station: Reforestation on site of a total of 1,134 m^2 due to temporary and permanent clearings Redesign of Lauterbrunnen train station: Reforestation of 640 m^2 for provisional construction site entrance and extension of railway operating area
Jungfraubahn AG	Clearance of the Guggi glacier foreland with aspiring Bernese mountain guides (3.7 tonnes of scrap iron and civil waste in 2016, 2.7 tonnes in 2015)

Clearance of the Guggi glacier foreland with aspiring mountain guides

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 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

For the environment

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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For the environment

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

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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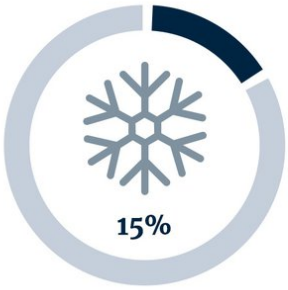


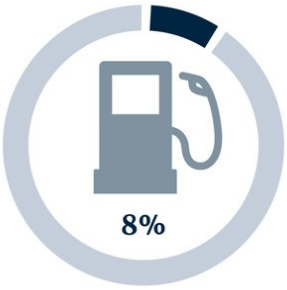
Snow production

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

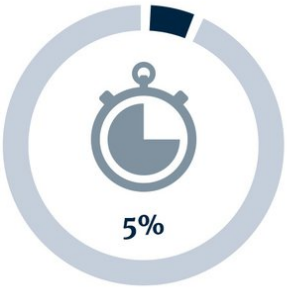


Fuel

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

For the environment

PROMOTION OF UNESCO WORLD NATURAL HERITAGE

Jungfrau Railways was the co-initiator of the idea to make the Jungfrau-Aletsch area the first UNESCO World Heritage Site in the Alps. It has supported UNESCO Swiss Alps Jungfrau-Aletsch (SAJA) since its inception. Jungfrau Railways takes its responsibility for the UNESCO World Natural Heritage Site seriously and attaches great importance to its care and protection. It intensified its collaboration with the SAJA Management Centre as part of the opening of the World Nature Forum in the summer of 2016, and at the same time it granted an extension of the existing support for the strengthening of the label starting in 2017. During the realisation of the V-Cableway, it will fully respect the goals and provisions of the World Heritage Site in planning, construction as well as after the commissioning.

World Nature Forum und UNESCO-Label

Jungfrau Railways carriages at the World Nature Forum (Valais)

For the environment

PROMOTION OF PUBLIC TRANSPORT OFFERS

Swiss Pass

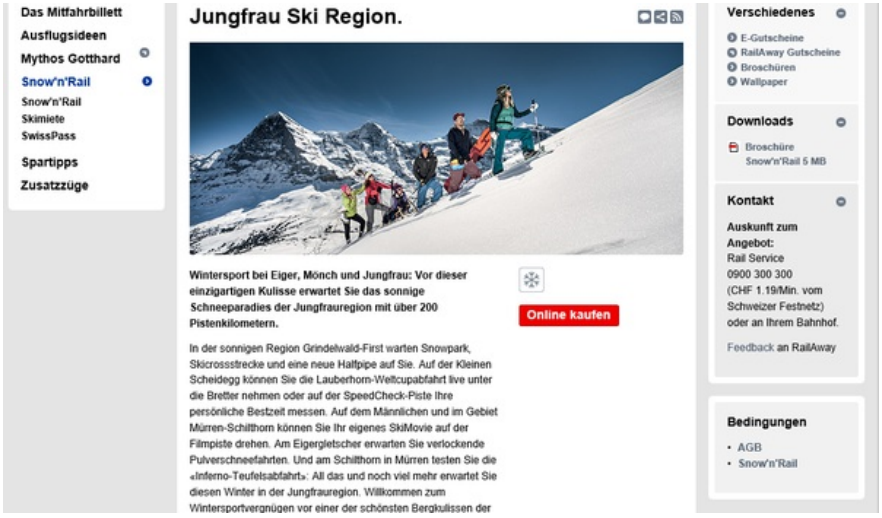
When the public transport Swiss Pass was launched in the year 2015, Jungfrau Railways was one of the first and largest ski destinations around. It promotes the link between public transport and winter sports. The Swiss Pass emphasizes its goal of getting winter athletes off the road and onto the railway. Jungfrau Railways appreciates that their customers who travel by public transport can activate their winter sports pass directly on the Swiss Pass. With the integration of additional services on one card, the Swiss Pass promotes the convenience that is increasingly in demand and offers the customer added value with the extended offer.

Into the Jungfrau Ski Region with the Swiss Pass

Snow 'n' Rail

In order to further promote travel by public transport, the Jungfrau Ski Region is part of the «Snow 'n' Rail» offer from SBB and RailAway. It is one of the 40 most popular ski resorts, offering the ski pass at a discounted rate in combination with a public transport ticket.

For the environment



Snow 'n' Jungfrau Ski Region Rail Offer (print screen offer page sbb.ch)

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