



# **SEILBAHNEN INTERNATIONAL**

## **TROY NEDVED EUROPEAN INNOVATIONS IN BIG SKY**

**GEORGIA  
SKI RESORT ON THE  
DRAWING BOARD**

**VIETNAM  
NEW FUNICULARS SERVE  
THE HIGHEST MOUNTAIN**



**MOUNTAIN  
NETWORK  
SUMMIT  
2026**



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# SPACES OF OPPORTUNITY VS SPACES OF RESTRICTION

That the ski resort industries in the US and Europe can learn from one another is a truism. However, what that means in detail is known only to those who closely follow market trends, structures, and key figures.

One of them is **Troy Nedved**, President and COO of the US ski resort Big Sky in Montana. In our cover interview, he speaks, among other things, about technical innovations and staging concepts from Europe that he successfully applies to his own resort.



**Gerald Pichlmair**  
Publisher

Conversely, European ski resorts still have a lot to learn from the US when it comes to sales and marketing, as our interview with **Doug Fish** from Indy Pass demonstrates. Managing lift lines also tends to work better in the US than in Europe – at least according to **Alan Henceroth**, President and COO of A-Basin (Colorado), in his interview with SI.

As the publisher of a B2B magazine, I personally get the impression that

Europe has unfortunately developed into a space of restriction, whereas North America offers more opportunities and potential. But even in other parts of the world, barriers to ski tourism

seem to be lower than in the “birthplace of winter sports.”

A current example is the Sairme Resort project in Georgia: here, a brand-new ski area is being designed from scratch, featuring 18 cable cars, 36 kilometers of slopes, 144 hectares of skiable terrain, and three reservoir lakes.

In the Alpine region, such a greenfield development would be unimaginable.

As we can see, every region has its strengths and weaknesses – and we can learn from one another. A great opportunity to do so is the networking event **Mountain Network Summit**, taking place from September 16 to 18, 2026, in Alpbach, Austria.

Ski resort operators from all countries are warmly welcome!

## INDUSTRY-IMPORTANT DATES

September, 16 – 18, 2026

**Mountain Network Summit**  
Alpbach (AT)

September, 23 – 25, 2026

**Swiss VTK-Convention**  
Thun (CH)

October, 06 – 08, 2026

**Mountain Technology Symposium**  
Hood River Inn, OR (USA)

October, 20 – 21, 2026

**Forum Ropeways Switzerland**  
Interlaken (CH)

October, 26 – 28, 2026

**German Ropeway Conference**  
Ochsenkopf (GER)

January, 12 – 14, 2027

**NSSA Western Conference**  
Big Sky, MT (USA)

April, 04 – 10, 2027

**Interski Vail 2027**  
Vail, CO (USA)

April, 20 – 23, 2027

**Interalpin**  
Innsbruck (AT)

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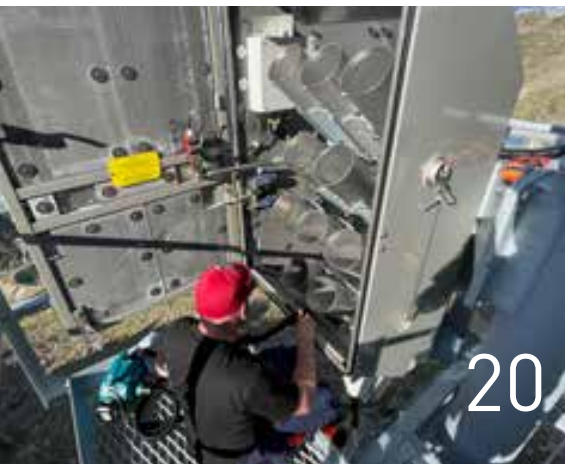
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# Bike Clip: Hang it, hop on, lean back!

When the snow melts in the mountains, skis and snowboards make way for bikes. The Bike Clip for chairlifts makes the seasonal transition easy for operators—without the need for additional vehicles. Mounted on the back of the chair, it can be installed with bubble. Up to four bikes per chair can be transported safely and efficiently to the summit, ensuring a comfortable mountain experience all year round.



© Colton Stiffler / Big Sky Resort

Big Sky Resort in Montana is known for its immense scale, with about 2,370 hectares of lift-served terrain and Lone Peak rising to 3,403 meters.

## THE BIG SKY EXPERIENCE: EUROPEAN INNOVATIONS ON AMERICAN MOUNTAINS

Over the past decade, Big Sky Resort has invested heavily in modernization, adding 20 lifts. President and COO Troy Nedved discusses why the American market has embraced European technologies, which innovations are interesting for the US market, and the resort's next steps.

**SI:** *Big Sky has added 20 new lifts. Why was the transformation necessary?*

**Troy Nedved:** The word “necessary” can be interpreted in a lot of ways, but this was a core part of our long-term vision. Our CEO, **Stephen Kircher**, spent a lot of time in Europe. He saw the incredible technology and investment in lift infrastructure over there, which is a very different model than what we typically see in the US. Stephen saw an opportunity to completely transform the mountain experience in North America. By applying a robust lift network to our mountains, our goal was to keep lift lines to an absolute minimum and provide an exceptional guest experience. We wanted to do it differently than anyone else in North America.

*What key aspects of the guest experience did you aim to improve?*

First, we have always been known for not having lift lines. We actually average about an acre of terrain per skier even

on a busy day, which is highly uncommon for destination ski areas both here and in Europe. The second aspect is specific to the type of lifts we chose. Montana can be cold – on average, it's colder and at a higher elevation than its European counterparts. We wanted to insulate our guests from those elements. By adding blue bubbles, heated seats, and focusing on fast, quiet lifts, our goal was to buffer the cold temperatures and mitigate the less desirable aspects of the weather.

Troy Nedved,  
President and COO,  
Big Sky Resort.



*Which technical features of the new lifts are particularly important to you?*

We've embraced Doppelmayr's D-Line technology, primarily for its reliability and longevity – these are 50-year lifts. We've even embraced the new Fatzer rope systems, which are extremely quiet. All the fine details around these new machines are a surprise to our guests because they simply aren't used to seeing them anywhere else in North America.



Modern lifts equipped with heated seats and protective bubbles.

© Ethan Schumacher / Big Sky Resort





© Kirby Grubaugh / Big Sky Resort



© Nicole Wickens / Big Sky Resort



© Andrea Gentl and Martin Hyers / Big Sky Resort

Beyond the slopes: Big Sky Resort offers a two-story glass observation deck, an igloo, and a Michelin-starred restaurant.

*Are autonomous technologies relevant to you?*

They are. We are highly interested in technology that allows us to run these lifts with less staff, while also making the experience better and safer. We are currently waiting to see how the technology evolves. We haven't tested it yet, but we are definitely interested.

*At the end of 2025, you also opened the observatory. What inspired it?*

We were ranked the number one ski resort in North America last year, and we've known we have the best skiing for a really long time. Now, we're trying to develop the "and" – the part of the mountain experience that goes beyond just skiing. Every family has someone who might not be a hardcore skier, and we also have our summer season. We wanted to add that touch of more experiences, that true "wow" factor. You see this in France and other places across Europe, where high-alpine observatories are a key part of the experience. It was something we wanted to bring to Big Sky. What better place to do it than on what we call "America's Matterhorn"? The observatory is exceptional because you get pristine 360-degree views and can see three different states from that one location.

*What other new attractions have been introduced at the resort in recent years?*

Just last year, alongside the new gondola – which gave non-skiers a direct route to the tram and the summit for the very first time – we introduced a new igloo. This was inspired by a European experience. Beyond that, we are actively expanding our culinary offerings. Recently, we brought fine dining to our village with a Michelin-star restaurant called M. That is something very atypical for the US ski environment, and it really goes beyond the traditional American ski experience.

*Which upgrade has had the biggest impact on daily operations and guest flow?*

It is the Explorer gondola, because it plays a key role in allowing so many other things to happen. For the first time, it allows foot traffic to connect directly to the tram and the summit. It also completely transforms our beginner experience. We are moving all of our beginner skiers and ski lessons out of the base area and up to a beautiful new mid-mountain complex – we're going to have one of the best beginner areas in the world. The gondola has been the key that ties everything together up to this point, and there are another five to ten projects that can now happen specifically because of that lift.

*Is Big Sky, like the Alps, expanding its focus beyond the winter season?*

That is a large part of why we built this infrastructure. We've been building a trail network around the new lift infrastructure so people can experience the mountain all the way from the gondola, up to the tram, and eventually to the clear views at the summit. For mountain biking, our network is incredibly robust. We have exceptional downhill trails, and we run five of our lifts in the summer specifically for our bike park. We've even added brand-new Doppelmayr Bike Cabs to our gondola (*learn more on page 10-11*).

*What do you see as the next frontier for US ski resorts?*

The next chapter for us is our 2040 vision, which we will probably be announcing in the next year or so. It's largely going to focus on connecting the hospitality component to the full guest experience. We want to introduce elements that go beyond just exceptional skiing and high-end lifts. We are focusing heavily on hospitality – integrating hotel brands, spas, and other unique on-mountain experiences that appeal to much more than just the traditional ski enthusiast, both in summer and winter.

*Interview: Gerald Pichlmair*



The Explorer Gondola connects the Mountain Village with the summit of Lone Peak: The first time in Big Sky's history that full lift access exists in both summer and winter. © Claire Lichtwardt, Andrew Belli/ Big Sky Resort

# GEORGIA: SKI RESORT ON THE DRAWING BOARD

The automotive group Tegeta plans to build a mountain destination in Georgia. The Sairme Mountain Resort will encompass three locations, with the planned Lamazgora ski area set to be developed across five distinct phases.

Tegeta Motors is the largest automotive and mobility holding company in the Caucasus, headquartered in Tbilisi, Georgia. The corporate group covers the areas of passenger cars, commercial vehicles, construction machinery, spare parts retail, leasing, and real estate development – operating primarily in Georgia, Armenia, Azerbaijan, and Central Asia. Now Tegeta also aims to become a ski resort operator and is currently developing the Sairme Mountain Resort in central Georgia.

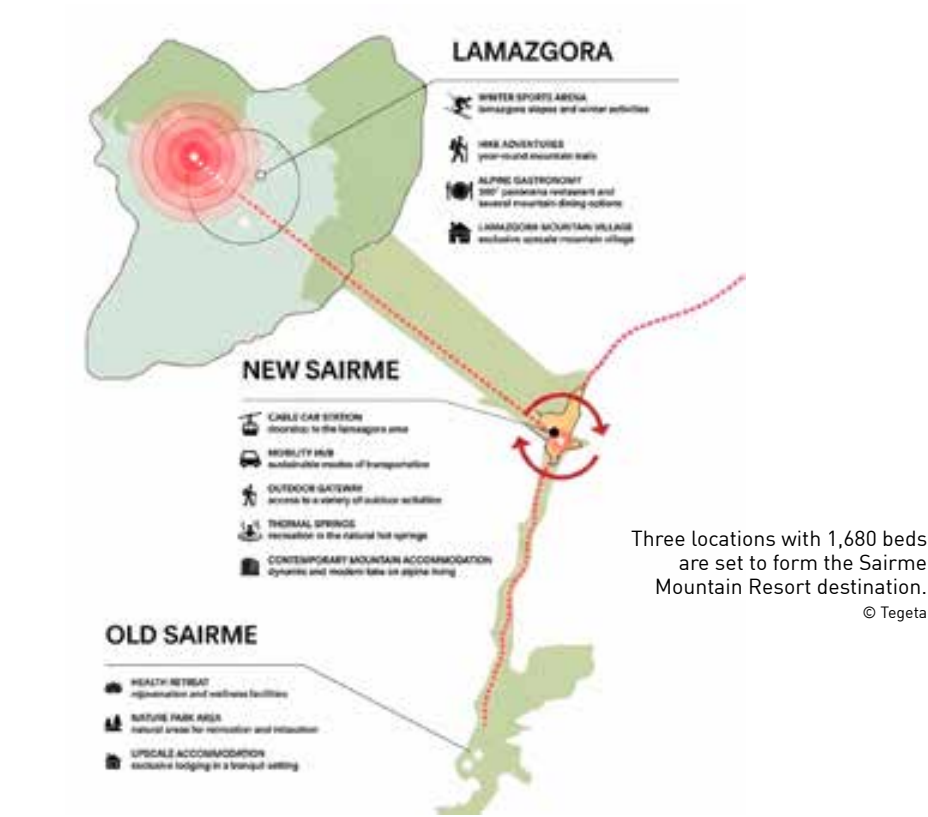
### Three locations – one destination

In doing so, the company is pursuing an overarching vision for a sustainable, year-round mountain destination that assigns unique identities to the three villages of Old Sairme, New Sairme, and Lamazgora.

Old Sairme is set to develop into a forest wellness resort, complete with facilities for health and rejuvenation, natural spaces for rest and relaxation, and upscale accommodations in a quiet setting.

New Sairme, on the other hand, will become an active recreation center and mobility hub, where the cable car designed to open up the Lamazgora ski area will meet other public transit options.

In addition, New Sairme will serve as the starting point for a wide range of outdoor activities and offer relaxation in local thermal springs, with accommodations featuring a dynamic, modern interpretation.



Lamazgora, in turn, is positioned as a mountain destination with panoramic summit views, hosting the actual ski resort and year-round hiking trails. A 360-degree panoramic restaurant, additional dining venues, and exclusive, upscale accommodations will form the Lamazgora Mountain Village.

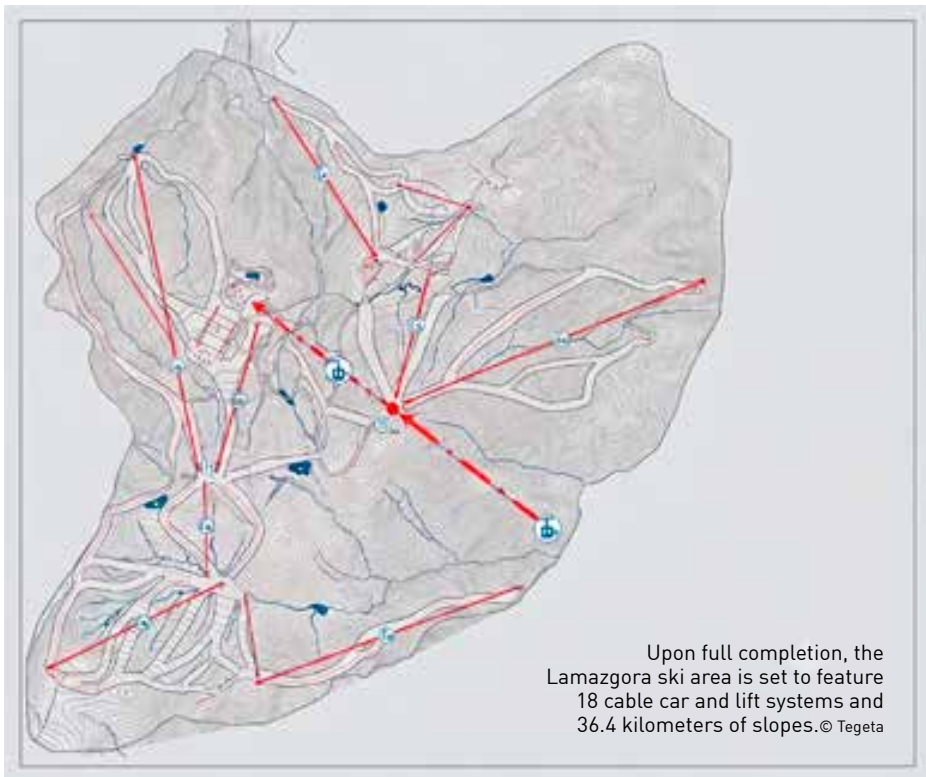
### Ski Resort in five steps

The Lamazgora ski area is set to be developed in five phases. Starting in 2027, the construction of seven ropeways is

planned, with 18 lifts ultimately operating on the mountain by the late 2030s. This corresponds to an increase in transport capacity from 10,000 to 24,500 people per hour. The total slope length will gradually expand from 10.7 to 36.5 kilometers, representing a growth in slope area from 48 to 144 hectares. For snowmaking, three reservoir ponds with a total volume of 150,000 cubic meters will be constructed. Furthermore, upon full expansion, project leaders are planning five restaurants with a seating capacity of

| SKI RESORT DEVELOPMENT I               | SKI RESORT DEVELOPMENT II              | SKI RESORT DEVELOPMENT III             |
|----------------------------------------|----------------------------------------|----------------------------------------|
| <b>Lamazgora – Stage 1 (2027-2028)</b> | <b>Lamazgora – Stage 2 (2029-2030)</b> | <b>Lamazgora – Stage 3 (2031-2032)</b> |
| Cable Cars7                            | Cable Cars9                            | Cable Cars10                           |
| Transport capacity10,000 p/h           | Transport capacity13,500 p/h           | Transport capacity15,500 p/h           |
| Slope length10.7 km                    | Slope length18.2 km                    | Slope length26.4 km                    |
| Skiable area48 ha                      | Skiable area82 ha                      | Skiable area112.3 ha                   |
| Reservoirs1                            | Reservoirs1                            | Reservoirs2                            |
| Skier capacity3,057                    | Skier capacity4,094                    | Skier capacity5,545                    |
| Restaurants2                           | Restaurants2                           | Restaurants3                           |
| Annual lift tickets470,000             | Annual lift tickets600,000             | Annual lift tickets760,000             |





1,200. Through all these measures, the ski area's daily capacity is expected to rise from 3,057 to 7,375 skiers, which should also positively impact ticket sales. Initially, Tegeta aims to sell 470,000 lift tickets, targeting one million tickets by the late 2030s.

**Developer seeking suppliers**

To implement the planned infrastructure, Tegeta relies on a wide variety of external companies. The project developers are looking for manufacturers for a 10-person gondola (4.5 km main route), 4- and 6-person chairlifts, surface lifts, and magic carpets (conveyor belts).

In addition, specialists in snowmaking are required to cover 28 kilometers of slopes, or 101 hectares of slope area. For this purpose, three reservoir ponds and two water intake points are planned, along with snow generators (snow cannons and lances), pumping systems, and automation software. For grooming 36.4 kilometers of slopes, Tegeta plans a

dedicated fleet of snowcats, some of which will be equipped with winches for steep terrain and a fleet management system for increased efficiency. Digital systems are also high on the shopping list, including solutions for ticketing, turnstiles, RFID/NFC systems, resort management software, visitor analytics tools, and booking platforms. Meanwhile, safety in the ski area will be ensured through a wide array of measures, including avalanche protection systems, safety netting and fencing, slope signage, information boards, and emergency response systems. Last but not least, Tegeta is looking for experts in resort planning and consulting, covering alpine architecture, environmental impact assessments, ski resort operations, gastronomy concepts, and hotel and hospitality design. Tegeta's ultimate goal is to turn the master plan for the Sairme Mountain Resort into Georgia's leading mountain destination.

ts

**SKI RESORT DEVELOPMENT IV**

**Lamazgora – Stage 4 (2033+)**

|                     |            |
|---------------------|------------|
| Cable Cars          | 13         |
| Transport capacity  | 19,100 p/h |
| Slope length        | 30,5 km    |
| Skiable area        | 112.3 ha   |
| Reservoirs          | 3          |
| Skier capacity      | 6,418      |
| Restaurants         | 4          |
| Annual lift tickets | 880,000    |



**SKI RESORT DEVELOPMENT V**

**Lamazgora – Stage 5 (Full Expansion)**

|                     |                 |
|---------------------|-----------------|
| Cable Cars          | 18              |
| Transport capacity  | 24,500 p/h      |
| Slope length        | 36.4 km         |
| Skiable area        | 144.5 ha        |
| Reservoirs          | 3 (150.000 m³)  |
| Skier capacity      | 7,374           |
| Restaurants         | 5 (1.200 seats) |
| Annual lift tickets | 1,000,000       |



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**CITY CABLE CAR  
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Guests load their bikes into the 20 Bike Cabs on the Loischkopfbahn (Austria) on their own. © Bergbahnen Brandnertal | Roman Nöstler

## DOPPELMAYR GROUP: BIKE CABS AS A STRATEGIC CHOICE

Three new gondola lifts on both sides of the Atlantic – the Loischkopfbahn, the Mighty Argo Cable Car, and the Explorer Gondola – are now in operation. All three are equipped with Bike Cabs to transport bicycles up the mountain, helping operators achieve key strategic goals.

Without a doubt, Doppelmayr's *Bike Cab* offers the most elegant way to transport bicycles using a gondola lift. At the valley station, bikers independently load their bicycles into the rotating rack located in the center of the *Bike Cab* before boarding the following passenger cabin. At the top station, guests have plenty of time to easily unload their bikes. Lift operators benefit as well: passenger cabins remain protected from dirt and damage, significantly extending their service life. Furthermore, carrying up to eight bicycles per vehicle, *Bike Cabs* offer high transport capacity – especially when combined with the high travel speeds of modern Doppelmayr ropeways of up to seven meters per second.

### Bike Cabs rotate in the stations

Thanks to the automatic rotation of the central rack, eight bikes can be loaded sequentially. Floor markings in the station show guests exactly where to stand to load their bikes as quickly as

possible. As the *Bike Cab* leaves the valley station, the rack rotates so that the first bike loaded is also the first one ready to be unloaded at the top. Every rider knows right from the start where to retrieve their gear. At the top station, this rotation – combined with the *Bike Cab* remaining stationary for several seconds – gives guests more than enough time to retrieve their bikes.

### The Loischkopfbahn as a Bike Cab Lift

Recognizing these benefits, Bergbahnen Brandnertal (Austria) recently chose to integrate 20 *Bike Cabs* into their new 10-passenger Loischkopf gondola. Bikepark Brandnertal – a success story since August 2014 – has established itself over the past decade as a key fixture in the downhill mountain biking scene. While the converted Einhornbahn II and former Loischkopfbahn chairlifts previously transported guests and their bikes during the summer, they were slow. Long wait times due to limited capacity prompted the resort to take action.

### Year-round Bike Cabs?

As a result, the new 10-passenger Loischkopf gondola replaced two fixed-grip chairlifts as well as the Tschengla T-bar lift, providing a modern, comfortable, and safe solution for transporting bikes via gondola. "During planning, we placed great emphasis on ensuring the lift works exceptionally well for mountain bikers so we can build a consistent, year-round tourism model," says **Michael Marte**, Managing Director of Bikepark Brandnertal. Resort Director **Michael Domig** adds: "We looked closely at tourism trends and future developments. We believe it is entirely feasible for guests to ski in the upper part of the destination while others ride bikes lower down."



Operating in two sections, the 10-MGD Loischkopfbahn spans 1,829 meters, climbs 617 vertical meters in 7.9 minutes, and carries up to 2,500 passengers per hour with 60 cabins. © Roman Nöstler





The five Bike Cabs in Colorado are designed as "Gold Nuggets." © Mighty Argo Cable Car



During the summer, the Explorer Gondola in Big Sky has 19 Bike Cabs on the rope.



The Explorer Gondola now provides full access for bikers. © Big Sky Resort

### Flagship Project in Colorado

*D-Line*, *DirectDrive*, and *Bike Cabs* – a flagship project for Doppelmayr went into operation in Idaho Springs, Colorado (USA) this year. According to founder **Mary Jane Loevlie**, the 10-passenger Mighty Argo Cable Car gondola has transformed the former gold mining town into a major tourist attraction since spring 2026. From the "Argo Station" mine museum, a 10-minute ride covers roughly 1.4 kilometers and 400 vertical meters up to "Miners Point." At the top, visitors are treated to views of historic mining facilities, Clear Creek Valley, and surrounding peaks including Mount Blue Sky and other 14ers (mountains over 4,000 meters). A panoramic restaurant, playground, and amphitheater host events, entertainment, art, and dining. Furthermore, "Miners Point" serves as the starting point for nature and history trails, as well as over 45 kilometers of hiking and biking trails.

### First Bike Cabs in the USA

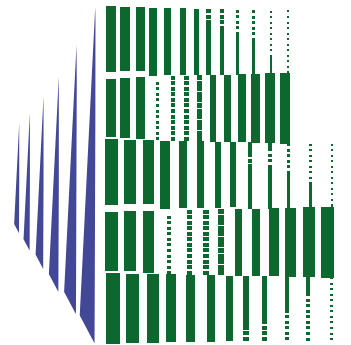
This milestone marks the debut of *Bike Cabs* in the United States, with 5 of the 22 golden cabins designed specifically as Bike Cabs. "Idaho Springs already sees up to 1,000 cyclists per day at times. With the cable car, those numbers will increase dramatically – year-round, since snow doesn't stick around here," says Mary Jane Loevlie. Instagram videos from the soft launch on April 24 confirm that the transport cabins are a huge hit with riders, a trend that was mirrored during the grand opening on May 9.

### Bike Cabs Expand to Montana (USA)

The Bike Cab strategy is paying off across the US: On June 16, another system featuring 19 Bike Cabs began operation – the

Explorer Gondola in Big Sky, Montana. Operating across two sections since the 2025/26 winter season, the new gondola replaced the former Explorer double chairlift.

The system transports up to 2,850 guests per hour with a ride time of approximately 8.8 minutes. Designed intentionally for both winter and summer use, resort officials built an extensive trail network around the new lift infrastructure. Big Sky offers an impressive mountain biking setup, as COO **Troy Nedved** noted in an interview with SI (*learn more on page 08-09*): "We have outstanding downhill trails and operate five of our lifts in the summer specifically for our bikepark." The Explorer Gondola's Bike Cabs play a crucial role in that vision. ts



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The 10-MGD Mighty Argo Cable Car spans a length of 1,681 meters, climbs 396 vertical meters in ten minutes, and carries up to 1,300 passengers per hour utilizing 22 cabins. © Mighty Argo Cable Car

# DOPPELMAYR GROUP: TWO NEW FUNICULARS SERVE VIETNAM’S HIGHEST MOUNTAIN

Garaventa has completed two new funiculars on Indochina’s highest mountain, Fansipan in Vietnam. The installations expand the existing access to the summit area and improve visitor flow between the various attractions.

Fansipan in northern Vietnam, at 3,143 metres, is the highest mountain in Indochina. Access to the summit area is provided by several ropeways operated by the Doppelmayr Group. From Sa Pa, a funicular railway leads to the valley station of the Fansipan Legend 3S ropeway, which transports visitors to the summit area. From there, the Fansipan Peak funicular railway provides access to the mountain summit.

Due to the high number of visitors, the infrastructure has now been expanded to include two new funiculars: the Fansipan Coaster and the Fansipan Top. Both facilities were officially opened on 11 July 2026.

### Sharply varying gradients, challenging implementation

The Fansipan Coaster is characterised by its exceptional route profile with sharply varying gradients. Whilst the lower section is comparatively flat, the route rises significantly towards the end. This combination placed high demands on the system’s design and required special technical solutions for the rope guidance. The two vehicles (CWA) were also specially adapted to the route’s unusual



The Fansipan Coaster is characterised by its exceptional route profile with sharply varying gradients. The route rises significantly towards the end. © Garaventa

characteristics. The seating arrangement takes account of the varying gradients and ensures that passengers enjoy the same level of comfort whether travelling uphill or downhill. The Fansipan Top has a constant gradient and is designed as a compact, single-car funicular. The two funiculars have different drive systems, each tailored to the specific requirements.

Whilst the Fansipan Coaster has an adhesion drive at the mountain station, the Fansipan Top’s carriage is driven by a winch. The construction of the installations placed high demands on planning and logistics. Access to the construction site was limited due to its high altitude. Materials and components had to be transported up the mountain via the existing Fansipan Legend 3S ropeway and then taken to their final destinations from there using numerous material ropeways. The Doppelmayr Group and the Sun Group have already jointly implemented umerous ropeways in Sa Pa and throughout Vietnam. As a centre of excellence for specialised ropeways, Garaventa was responsible for the construction of the two new funiculars.

TECHNICAL DATA

51-FUL Fansipan Coaster, Sa Pa (VNM)

Client:

Sun Group

Inclined length:

186 m

Vertical rise:

58 m

Capacity:

1,000 p/h

Speed:

3 m/s

Opened:

07/2026

TECHNICAL DATA

60-FUL Fansipan Top, Sa Pa (VNM)

Client:

Sun Group

Inclined length:

53 m

Vertical rise:

38 m

Capacity:

1,000 p/h

Speed:

2 m/s

Opened:

07/2026



The funiculars improve visitor flow between the various attractions.



# THE CORPORATE ANTIDOTE: HOW INDY PASS RETHINKS “BIGGER IS BETTER” IN SKIING

Indy Pass founder Doug Fish explains what the typical Indy Pass holder looks like, the strategy behind their unique two-day limit model, the upcoming expansion plans into Europe, and how climate uncertainty has driven last-minute bookings across the industry.

**SI:** *The Indy Pass positions itself as the “antidote” to mega-passes. What is the philosophy behind it?*

**Doug Fish:** The Indy Pass was designed to serve two distinct markets. First, consumers who are either casual skiers – hitting the slopes four to six times a year – or people who want to travel and experience new resorts. The second market is independent ski areas. That’s exactly where the name comes from: “Indy”. In the United States, there are about 450 lift-served ski areas, and around 150 of those are owned by large corporations. That leaves a huge number of independent ski areas. Having done marketing for ski areas for nearly 40 years, we clearly saw an opportunity to connect these independent resorts with the massive demographic of casual skiers. The biggest difference with the Indy Pass is that you only get two days at each resort, with a third day available at a discount. We restrict our days specifically so we don’t cannibalize local season pass sales.

*Who is the typical Indy Pass holder?*

The typical Indy Pass holder is a 36-year-old male. In general, our demographics mirror the wider ski industry: mostly between the ages of 25 and 44, skewing male. However, we also attract a lot of families. We offer a very inexpensive pass for kids aged 12 and under, priced at around \$150 to \$180.



**Doug Fish**  
Indy Pass founder

*How many destinations does it include globally and in Europe?*

This year, we are guaranteeing 300 resorts globally. Out of those, we will have 50 destinations in Europe. It includes seven resorts in Austria and one in Germany. Our goal is to have over a hundred resorts in Europe by 2027-2028.



The Indy Pass gives skiers access to more than 300 ski areas across four continents, including two days at each destination. © Screenshot from the Indy Pass website

*From the perspective of an European ski resort, what is the benefit of joining?*

It is primarily a vehicle to market in the US and generate traffic from American skiers. We do not sell many passes in Europe currently, but there are plans afoot to more aggressively market the pass there, particularly in the UK.

Furthermore, for all the guests who arrive, the resorts get their data – names, addresses, emails, and phone numbers – and they become part of their database. Those people then go back to the United States and advocate for those resorts. So it’s a marketing program that generates guaranteed revenue.

*How many American tourists have come to Europe via the Indy Pass in recent years?*

We don’t publish our numbers, but I can tell you that our visits to Europe doubled last year. This year, we added a lot of resorts in Europe – I think we went from about 15 to 30, 35, or maybe 40 – and our visits are up 300 percent. Our pass sales have increased by 30 percent every year for the last four years.

*Which recent innovations are you particularly proud of?*

I’m incredibly proud of our employee pass program. If you’re a partner resort, your employees can buy the pass for just \$25. It’s also an excellent hiring tool for seasonal staff. We also launched the “Learn to Turn” pass for the beginner market. For \$179, beginners got three days of lift tickets and three rental packages – including skis, boots, and poles, or snowboard gear – at about 40 participating resorts. On top of that, we sent a \$40 discount to all of our existing pass holders to share with friends.

*What trends are shaping ski tourism?*

First, weather and climate have become such massive factors now. People are booking their trips at the very last minute because you just don’t know where the snow is going to be. The second trend we’re seeing, especially with the Indy Pass, is that people are buying it specifically to travel.

*Interview: Gerald Pichlmair*



Read the full interview on the SI website.

# TÉLÉ-VILLARS AND KÄSSBOHRER: MUTUALLY BENEFICIAL PARTNERSHIP

How does a ski resort pave the way toward a more sustainable and efficient future alongside its technology partners? Together with Kässbohrer, the Swiss destination of Villars-sur-Ollon demonstrates how such a partnership of equals works – and what concrete steps result from it.

In the Swiss resort of Villars-sur-Ollon, winter is a reflection of a deep commitment to nature, guests, and future generations. Télé-Villars-Gryon-Diablerets SA is pursuing this path alongside its partners. For more than 30 years, the resort has worked closely with Kässbohrer Geländefahrzeug AG. This exceptional partnership is built on trust, shared goals, and the conviction that innovation is the key to the future.

## The future is created today

“We not only want to offer our guests perfectly groomed slopes but also demonstrate that we take responsibility – for the environment, resources, and future generations,” explains **Martin Deburaux**, Managing Director of Télé-Villars. “That is why we rely on sustainable technologies and digital solutions from Kässbohrer, which help us make snow production and snow management as efficient and environmentally friendly as possible.”

A key pillar of this transformation is the operation of four *PistenBully 600 E+* vehicles alongside Kässbohrer’s digital *SnowSat* solutions. Villars operates one of the largest E+ fleets worldwide. While power and torque are clear advantages, the outstanding feature is the unique combination of diesel and electric drive technology. “For our team, efficiency and sustainability are important, but so is the



Télé-Villars has one of the largest electric fleets in the world: no fewer than 4 PB 600 E+ groomers maintain the slopes in an environmentally sustainable manner.

impressive performance of the machine,” says **Oscar Bonzon**, Head of the operator’s team.

## SnowSat: The key to greater efficiency

*SnowSat* solutions provide the grooming team with continuous insight into snow depths, infrastructure, and operational processes throughout the ski area. Cross-functional task management enables clear communication when coordinating snow groomers and daily operations. Snow depth can be measured with centimeter-level accuracy, allowing snow to be moved precisely where needed and reducing unnecessary snow

use. One of Villars’ four *PistenBully 600 E+* machines is equipped with *SnowSat LiDAR*, measuring snow depths up to 50 meters ahead of and alongside the vehicle across an area of up to 2,600 m<sup>2</sup>. This enables operators to manage snow proactively, avoid low-snow areas, and save valuable time.

*SnowSat LiDAR* measures, documents, and optimizes the use of available natural and technical snow while supporting faster and more targeted snow distribution. *SnowSat* is a key tool for efficient resource management, enhanced safety, and consistently high slope quality.

## SMARTCUT: A GROOMING FINISH THAT MAKES THE DIFFERENCE



### SmartCut tiller: The quality of the groomed surface and the efficiency of snow grooming have been a resounding success in Villars across the board.

Last winter, Télé Villars-Gryon also introduced its first SmartCut tiller, which quickly proved successful across the board. “Anyone who tries it never wants to give it back,” says Oscar Bonzon. The outstanding grooming quality and efficient snow processing have impressed the entire team. Snow is processed more finely, distributed more evenly, and mixed more effectively within the tiller chamber, creating a superior and highly consistent slope surface. At the same time, snow ridges along slope edges are reduced, while excellent results are maintained even under challenging conditions.

For Bonzon, the progress compared to previous tiller generations is obvious: “The quality of the slopes today has nothing in common with what we achieved 20 years ago. Today’s machines operate in a completely different league.” As expectations among winter sports enthusiasts continue to rise, perfectly groomed slopes are more important than ever. The SmartCut tiller helps the team meet these demands with outstanding quality, high productivity, and noticeable ease of operation in everyday use.







Martin Deburaux, CEO of Télé-Villars, is committed to innovation, sustainable slope grooming, and trusting partnerships.



Oscar Bonzon (left), head driver, and Yann Jolidon, mechanic in Villars, appreciate the cooperation with Kässbohrer.



Reliability personified: Jean-Daniel Berclaz has been responsible for the Villars ski area for more than a decade.

Oscar Bonzon emphasizes the significance of this development: “Thanks to our PistenBully 600 E+ fleet and SnowSat, we can perform our daily work much more precisely and efficiently. The transparent fuel-consumption analysis has even sparked a friendly competition among our operators. The result is lower consumption, higher safety, and improved planning.”

#### Reliability has a name

For Télé-Villars, the close and trusted partnership with Kässbohrer is of exceptional value. “Our added value is Jean-Daniel,” says Martin Deburaux. He is referring to **Jean-Daniel Berclaz**, who has supported Télé-Villars as the regional contact for Western Switzerland for more than a decade, covering everything from sales and technical consulting to operator training and service support. “With Jean-Daniel and

Kässbohrer, we have a partner we can rely on at any time. Our collaboration is characterized by trust, expertise, and direct communication. We particularly appreciate the rapid support and high level of technical expertise that continually helps us in our day-to-day operations,” Deburaux adds.

#### New momentum. Tomorrow’s snow.

Alongside technical modernization, Télé-Villars is also actively advancing infrastructure projects designed to ensure long-term snow reliability. The perspective is clearly focused on the future. “We will still be skiing in this resort in 2050 – but it will be different,” says Martin Deburaux.

For Télé-Villars, the key to success lies in the intelligent combination of modern technology, sustainable thinking, strong partnerships, and, above all, people. Experienced *PistenBully* operators

play a decisive role in achieving exceptional slope quality – because experience continues to make the difference. “Partnership is extremely important to us, particularly in the areas of technical development, software, and snow management,” concludes Deburaux.



The slope crew’s daily briefing is effectively supported by SnowSat. © Kässbohrer

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Mulching meadows in summer and transforming them into perfectly groomed slopes, terrain parks, or cross-country ski trails in winter: The PistenBully 600 Polar GreenTech handles both tasks. This makes it the ideal year-round machine. © Kässbohrer

## YEAR-ROUND POWER FOR THE SLOPES: THE PISTENBULLY 600 POLAR GREENTECH

Perfect ski slopes do not begin with the first snowfall – they are prepared months in advance. The PistenBully 600 Polar GreenTech provides crucial groundwork during the snow-free season. As a pre-owned vehicle with versatile applications, it becomes a cost-effective key all-year-round.

The *PistenBully 600 Polar GreenTech* proves itself as a versatile all-rounder for ski resorts. Even without snow, it demonstrates its core strengths – tremendous pushing power, a low center of gravity, and exceptional off-road capability. This allows it to replace seasonally limited rental equipment and enables much more flexible preparation for the winter season. Once the snow arrives, it integrates seamlessly into the existing fleet and ensures maximum utilization.

### Year-round instead of downtime

Long before the first snowflakes fall, the crucial phase for optimal winter sports conditions begins in the mountains: mulching and preparing the ski slopes. Equipped with suitable tracks and a

special combination radiator including air conditioning, the machine can operate in temperatures of up to +40°C. With 490 hp, extremely low ground pressure, and excellent climbing ability, it easily masters the steepest slopes and the most challenging terrain.

A clear advantage: evenly mulched surfaces create a more stable and longer-lasting snow cover during winter. This reduces the energy required for snowmaking and minimizes the effort needed for slope maintenance – delivering both economic and environmental benefits for any ski resort.

### When technology makes the difference

The *PistenBully* also sets standards in terms of technology. Different track widths (XTrack at 1,150 mm or the

Combination Track at 1,648 mm) ensure optimal weight distribution and protect sensitive ground surfaces. The optional 360° rotating winch provides additional safety and traction in extreme terrain, while the hydrostatic drive system and intuitive one-hand controls make operation efficient and comfortable.

### More than a snow groomer

Thanks to its wide range of attachment and body options, the *PistenBully 600 Polar GreenTech* remains in operation throughout the year – from mowing and mulching to precise slope grooming in winter. A quick-change system, three-point hitch, and various PTO options open additional applications, making it an indispensable part of modern ski resort logistics.



Preparations at the La Norma / Valfréjus ski resort in France last autumn: The evenly mulched terrain creates a more stable and longer-lasting snowpack in winter. In this way, the PistenBully 600 W Polar GreenTech ensures optimal slope preparation. © Kässbohrer



# THE A-BASIN FORMULA: THE MOVE FROM VAIL TO ALTERRA AND TACKLING OVERCROWDING

In the SI interview, A-Basin President and COO Alan Henceroth discusses the transformation of one of Colorado's most distinctive ski resorts – from addressing overcrowding with a \$20 fee to joining Alterra – and what the European and American ski industries can learn from each other.

**SI:** *Why did you end the partnership with Vail Resorts after about 20 years?*

**Alan Henceroth:** We were partners with Vail for a long time, and it worked great, but we didn't have much control over how many people came. As we got busier, it started crushing the experience. Due to our location along a prominent high-elevation highway, more cars showed up than we could park. Guests were frustrated by traffic and lack of parking, while the highway department and state patrol were upset. We couldn't deliver the ski experience we wanted. So we decided to look for new partners. We contemplated going solely on our own, but in Colorado, most skiers want a choice – a pass that's good at multiple areas. We felt really well-aligned with Alterra and the Ikon Pass, so we partnered with them. A few years later, we ended up getting purchased by Alterra. Ultimately, what we were really looking to do was have much better control of visitation. We didn't want those days where the highway was a mess and guests were upset.

*How did you tackle overcrowding?*

We've tried a lot of different things to control visitation. We managed the amount of daily lift tickets we sold. That worked well for a few years, but it wasn't perfect. Whenever the skiing was really great, we still had problems with too many people showing up. The next move we made was to implement a parking reservation system for our busy weekends. We charge \$20 for the day, but if you carpool with four or more people, it's completely free. It ensures orderly parking where everybody gets a spot. Since starting this, our average ridership went from less than two people per vehicle to about three. We've done this for two seasons now, and the guests really appreciate it.



**Alan Henceroth**  
A-Basin's President and COO

*What technologies are you most proud of?*

I'd say our lift system. It's very up-to-date – our oldest lift is 18 years old, and the newest is just three. We also have a solid, simple snowmaking system, which we plan to expand as part of our upcoming master plan.

*What are the master plan's investment priorities?*

The very first things we're going to work on are expanding the snowmaking system and adding a little more parking. That includes a pedestrian bridge over the highway to make the flow of skiers arriving and leaving the mountain much smoother and easier at the end of the day. And the third thing we're working on is installing remote avalanche control systems.

*Which European ski industry practice you would like to adopt at your resort?*

I think we're actually working on one right now: remote avalanche control systems.

*What do you think European ski resorts can learn from the US, and vice versa?*

Europe could learn from us the organization in the lift lines. The mazes and queues could definitely be a little more organized over there. On the flip side, we have a lot to learn from Europe. From my observation, European resorts seem to operate with fewer employees. We can learn a lot about their technologies and ticket-scanning systems.

*Interview: Gerald Pichlmair*



Read the full interview on the SI website.



Arapahoe Basin, Colorado, is known for its extended ski season and challenging alpine terrain.

© Lucas Herbert, Arapahoe Basin



For the Schatzbergbahn, relying on trusted industry experts is the key to year-round success. © Alpbacher Bergbahn

## BEHIND THE SCENES IN THE AUSTRIAN ALPS: THE SECRET TO FLAWLESS OPERATIONS

Maintaining year-round cable car operations in the heart of the Alps is a big challenge. At Ski Juwel's Schatzbergbahn cable car, the team relies on a state-of-the-art snow groomer workshop, decades of expertise, and green energy to keep the resort moving.

The Schatzbergbahn cable car in Wildschönau-Auffach is one of the centerpieces of the Tyrolean cable car network and enjoys great popularity. The resort's name, "Ski Juwel" perfectly reflects the enthusiasm it sparks among guests and staff alike. Thanks to its year-round operation, the cable car is an essential engine for both local tourism and alpine infrastructure.

### The snow groomer workshop: Where technology meets precision

A key factor in the Schatzbergbahn's success is its state-of-the-art snow groomer workshop.

Completely rebuilt and opened in 2020 along with a new garage and refueling station, it serves as the maintenance hub for nine *PistenBully 600* machines in close cooperation with Kässbohrer.

For the past 33 years, **Michael Fill** has been in charge of maintaining these snow groomers, having originally completed his apprenticeship directly at Kässbohrer.

Together with **Florian Holzer** and **Thomas Unterberger**, who have been with the company for 21 and 24 years, respectively, the machines are serviced strictly according to the manufacturer's maintenance schedule.

Every 400 to 500 operating hours, the groomers undergo careful inspection. Their experience and dedication guarantee high quality and reliability of the fleet, ensuring the machines are always ready for action while retaining a high resale value.

### Year-round operations & green energy

The Schatzbergbahn cable car operates year-round: bringing skiers and snowboarders up the mountain in the winter, and transporting hikers to the peaks in the summer. The workshop is powered entirely by electricity from a regional hydropower plant.



Inside the Technology Center: Precision maintenance and high-quality support from MOTOREX ensure the snow groomer fleet is always ready.





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In addition, the hydraulic systems of the machines increasingly rely on the rapidly biodegradable hydraulic oil *ECOSYNT PAO 46* from Motorex. These sustainable initiatives highlight the resort's environmental awareness and make a vital contribution to protecting the region's nature.

#### The team: Experience an unity as success factors

A well-coordinated team is the backbone of the Schatzbergbahn's smooth operations. Managing Director **Ludwig Schäffer** leads the crew with deep expertise and a steady hand. Many employees have been part of the team for decades.

This long-standing collaboration creates an excellent working atmosphere built on mutual trust and professionalism. Together, they easily master daily challenges and remain open to new innovations.

#### Partnering with Motorex: More than just oil supply

Another crucial partner is Motorex, which has been working with the Schatzbergbahn cable car for over 14 years. The lubricant specialist provides not only premium oils and greases but also offers technical advice and



Premium Motorex lubricants, including eco-friendly hydraulic oils, are supplied straight to the workshop to keep the machinery running smoothly and sustainably. © Motorex

maintenance support. The oil is supplied directly into the workshop from a newly built storage room, ensuring an efficient and safe workflow.

The resort highly values Motorex's quick delivery times, high availability, and technical know-how. **Andreas Huter**, Area Manager for Tyrol and Vorarlberg, is in regular contact with the Schatzbergbahn team. With its *ALPINE LINE*, the company meets all necessary

manufacturer approvals for snow groomers – another key factor for flawless, trouble-free operations.

#### Ready for the future

Ultimately, the Schatzbergbahn stands out not only because of its modern technology and sustainable energy solutions but, above all, through the perfect interplay of an experienced team and strong industry partners.



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During the major service, the technicians from Inauen-Schätti check all the blasting systems – and sometimes a few sheep too. © Inauen-Schätti

## INAUEN-SCHÄTTI IN SÖLDEN: AVALANCHE PROTECTION IS REVENUE PROTECTION

Not only cable cars, but also avalanche protection systems must operate reliably to guarantee uninterrupted ski resort operations. The Bergbahnen Sölden (Austria) therefore rely on equipment and services from Inauen-Schätti, with infrastructure upgrades currently underway.

Bergbahnen Sölden operates its ski resort in Austria between altitudes of 1,300 and 3,300 meters above sea level – in a high-alpine, partly glacial area. Avalanche protection is correspondingly critical; otherwise, safe, comprehensive, and near-continuous operations would be impossible, likely resulting in severe economic consequences. After all, guests expect a perfect skiing experience every single day.

### How does Sölden manage blasting?

The local avalanche commission is out every day, keeping a close eye on the three areas of Gaislachkogel, Giggijoch, and the glacier. “To ensure that slopes, lifts, and sectors rarely have to be closed, we have defined around 400 avalanche trigger points across the entire ski resort,” reports **Manfred Fiegl**, Head of

Slope Operations at Bergbahnen Sölden. In doing so, the commission also relies on 26 avalanche masts and 20 avalanche guards from Inauen-Schätti. Some of the latter have been reliably in service since 1998 and are locally dubbed “avalanche organs.” Two of them are mounted on sleds and can be deployed fully mobile – particularly on the glacier. These stationary trigger systems offer massive support during adverse weather conditions, securing the main ski area so it can be operated safely for winter sports enthusiasts.

### Avalanche masts delivering maximum impact

Whether blasting mast or guard, the systems from the Swiss manufacturer rank among the most effective and reliable methods for triggering

avalanches, confirms **Jakob Fiegl**, Deputy Operations and Slope Manager at Bergbahnen Sölden: “Manual blasting is significantly more time-consuming, and helicopter blasting is only possible under the right weather conditions. With the avalanche masts and guards, however, we can trigger conveniently via software – quickly and independently.” The systems primarily protect vital cable cars, critical slopes, and the main ski resort – areas where an avalanche-related closure would cause severe disruptions to ski operations.

### Hardware & software: Sölden gears up

This is why the number of systems is increased every year, mostly alongside the construction of new cable cars. “For instance, this year we are installing two more LM5400 avalanche masts on the Gaislachkogel. There, we are replacing the old 1985 double chairlift with a high-capacity 6-person chairlift and reshaping the slope to create a family-friendly blue run. This new slope will be secured by the two new blasting masts,” Manfred Fiegl reports.

At the same time, the upgrade of existing trigger systems from radio control to cellular network control is moving forward, adds his colleague Jakob Fiegl: “19 trigger systems are already integrated into Inauen-Schätti’s



**Manfred Fiegl**, Head of Slope Operations, BB Sölden



**Jakob Fiegl**, Deputy Slope Manager, BB Sölden





The ski resort takes care of the minor service – which includes loading and basically checking the avalanche guards and masts. © BB Sölden

ATMS software, and seven more will follow this year. This makes our work easier on many levels – from explosives management to documenting the completed blasts.”

#### Major service

To ensure the avalanche guards and masts function flawlessly throughout the winter, they undergo a major service every three years. This year, it's that time again: over the course of two to three weeks, two technicians from Inauen-Schätti, working alongside two resort employees, inspect the mechanical and

electronic components of the systems and replace any defective parts. “The time and money are well invested here. Otherwise, we would face problems in the winter that would cost us significantly more,” says Manfred Fiegl, advocating for proactive maintenance. The software upgrades and the installation of the new systems are also carried out during this major service.

#### Minor service and emergency support

Resort technician **Thomas Nösig** plays a key role here, coordinating schedules and tasks between the ski resort and Inauen-

Schätti. He also leads the “minor service” during the years between major overhauls. This includes basic checks, loading the explosives boxes, and resolving minor issues. Major malfunctions are resolved via remote maintenance or by Inauen-Schätti technicians on-site: “The emergency hotline is available 24/7 in winter, but we’ve barely had to use it so far,” says Jakob Fiegl. The quality of the equipment and its maintenance clearly pays off – ensuring reliable avalanche protection and operational safety with minimal downtime. ts

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## Safety is no coincidence. It is actively shaped.





Preventive maintenance is the key to fail-safe gearboxes in ropeway systems. © Kissling

## KISSLING: DETECT & REPAIR ROPEWAY GEARBOX DAMAGE BEFORE IT BECOMES EXPENSIVE

Whether a ropeway gearbox is overhauled in time or fails unexpectedly depends entirely on the condition assessment. To achieve this, Kissling combines four mutually complementary methods.

No single procedure provides a complete picture of a gearbox's condition. Only the interaction of multiple testing methods makes emerging damage visible early on – and thus predictable, before it leads to a standstill of the ropeway system. Kissling AG combines four mutually complementary methods.

### 1. Visual inspection

The starting point is the visual inspection – either through the inspection ports or, more thoroughly, on the opened gearbox. The contact pattern of the gearing, backlash, bearing clearance, loose elements, and the lubrication system are assessed. The gears are tested for cracks using the dye penetrant method.

### 2. Acoustic testing

Noises reveal irregularities that the eye cannot see: rough running, misalignment of the drive shaft, imbalance, loose components, cracks, or tooth breakages. Bearing damage can be located acoustically at an early stage – though if the damage is audible, it is usually already advanced.

### 3. Lubrication and oil analysis

Lubrication is one of the decisive factors for service life. A significant portion of all failures is due to insufficient or incorrect lubrication; therefore, flow and pressure monitoring are also checked for correct adjustment and function. Regular oil analysis makes abrasion and wear measurable.

### 4. Vibration diagnosis

Vibration analysis, which is widely used today, rounds off the picture and, together with the other data, allows for time-based maintenance planning.

### Data as a supplement

The assessment only becomes complete with the operator's specifications – operating hours, oil quality, leaks, and anomalies on the input and output sides. From this overall picture, Kissling AG derives which measures a gearbox needs to ensure it continues to run reliably.

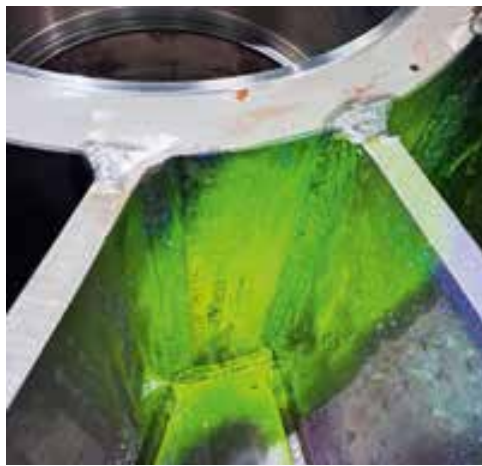
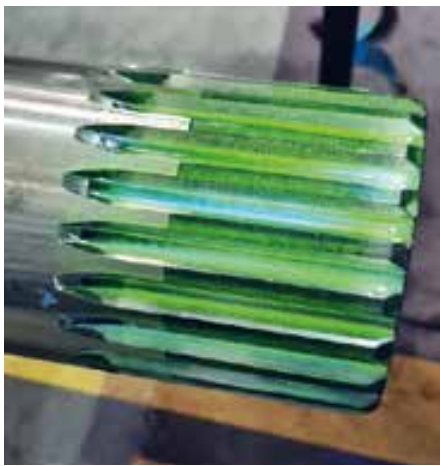
### Scope of the overhaul

Depending on the findings, the customer then orders a factory overhaul of the



The sandblasting system at Kissling AG offers enough space for a small car. The cleaning box – measuring five meters long, four meters wide, and four and a half meters high – is located in the production hall of the Swiss gearbox manufacturer in Bachenbülach near Zurich. The system cleans dirt and paint residue from old and used gearboxes to allow for a beautiful, comprehensive repaint.





The sandblasted gearbox is inspected for material cracks by Kissling AG using UT/MT (ultrasonic / magnetic particle testing).

gearbox listed above for the purpose of preventive maintenance. During this process, all bearings and seals are replaced, and all shafts, bores, and geared parts are checked for dimensional accuracy (fits) and condition.

#### Dismantling

In the first step, the remaining oil is drained and the gearbox is dismantled. The parts are then sandblasted and cleaned and – as mentioned above – tested for condition and dimensional accuracy, especially the output and hollow shafts. In addition, all geared components are inspected for cracks.

#### Findings

Depending on the findings, bearings, output shafts, wheels, pinion shafts, and the bevel gear set are replaced. In addition, parts are chrome-plated. If required, painting or further measures are carried out.

#### Assembly

After a successful overhaul, the gearbox is reassembled and the bevel gear set is adjusted. Subsequently, settings, clearance, and circulating lubrication are checked, and a test run is performed.

#### About Kissling AG

Kissling AG is a long-established Swiss company based in Bachenbülach, representing the highest level of competence in gearbox manufacturing. As a medium-sized family business, the company specializes in the development, design, production, assembly, and distribution of high-quality gearboxes for industrial, ropeway, and special applications. With around 40 employees, Kissling AG combines decades of experience with high flexibility and innovative strength. Well over 180,000 Kissling gearboxes are in use worldwide – proof of the reliability and quality of the products.

The company covers a broad spectrum: from standard solutions for industrial applications to ropeway gearboxes and highly complex special and turbo gearboxes for demanding fields of application. Kissling consistently relies on customized solutions, state-of-the-art technologies, and the highest quality standards, certified according to ISO 9001 and ISO 14001, among others. Thanks to international sales and service activities as well as a strong customer orientation, Kissling AG is a valued partner worldwide. The company combines tradition with an innovative spirit and continuously develops new solutions to meet the increasing demands of modern drive technology.

Learn more about Kissling:  
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# THAWING MOUNTAINS: RISKS FOR HIGH-ALTITUDE SKI RESORTS

High-altitude ski resorts are facing extremely rapid changes that were almost unimaginable just 20 years ago. Permafrost – ground or rock that remains frozen year-round – is warming up and thawing. What are the warning signs, and what can be done?

Long-term measurements in the Alpine region have shown a clear, persistent trend since the 1990s: the temperature in the frozen ground is rising, as seen in almost all observation boreholes. However, what is often underestimated is that permafrost does not need to reach zero degrees to become problematic. Even warming to temperatures just below the freezing point can significantly reduce the mechanical strength of the now only partially frozen material due to increased mountain water pressure, which in turn multiplies creep deformations.

## The threat to infrastructure

For alpine resort areas, this specifically means that foundations of installations that were previously stable can begin to shift. Lift towers start to tilt, mountain stations settle unevenly, anchors for cables and safety nets shift, and slope-side structures and retaining walls crack. In addition, there are slope movements involving entire rock shoulders and debris masses in which the structures are anchored, along with an increased risk of rockfalls.

## The Rockfall in Canada

Just how real this risk can be was demonstrated on March 12, 2026, in Whistler Blackcomb, Canada. In the early morning, a rockfall occurred on the north side of Whistler Peak at an altitude of around 2,130 meters, sliding about 300 meters down a slope that, fortunately, was still empty at that early hour.



The rockfall of March 12, 2026, near Whistler Peak in Canada. © BGC Engineering



Thawing permafrost poses a serious threat to ski resorts: what often starts harmlessly with cracks in concrete or jamming doors and windows can later lead to the severe consequences. The Piz Nair mountain station in the Swiss Engadin was confronted with exactly this problem.

© Engadin St. Moritz Mountains AG

The investigation into the cause of the damage is ongoing, but the incident is a striking example of how quickly high-altitude rock structures can change – with direct consequences for skiers, staff, and operations. Repairs and securing measures in such locations are technically demanding, expensive, and usually only possible during short summer windows.

## Warning signs:

### Subtle but serious

Initial warning signs are frequently subtle. They include cracks in concrete, jamming doors and windows, uneven settling at the base of a pylon foundation, slightly tilted or twisted lift towers, small misalignments between components, an increasing need for readjustment of tensioning and anchoring systems, or heightened rockfall activity. If installations require “readjustment” after every summer, this is a clear indication. Visible damage often points to an already advanced stage.

## Danger recognized: How to react?

The first step is a geoscientific site investigation. Permafrost maps can provide initial guidance, as demonstrated by the mountain station at Piz Nair in the Engadin, Switzerland. According to a permafrost map from the Swiss Institute for Snow and Avalanche Research (SLF), the mountain station of the aerial tramway is located in an ice-poor permafrost area with mean annual temperatures between 0 and -1°C. These indicators should be supplemented by a specific geotechnical survey, for example through boreholes and geophysical measurements. Old construction documents can often provide relevant clues as well – for example: was frozen material encountered during the excavation?

To implement the right measures, the geophysical processes must be thoroughly understood. The primary goal is to detect temperatures and their changes, as well as shifts in the subsurface and the infrastructure.





Permafrost-related ground ice and thermosyphon installation at Piz Nair, Engadin St. Moritz, Switzerland. © Engadin St. Moritz Mountains AG

Thermistor strings in boreholes provide critical temperature profiles over a depth of 20 to 30 meters and form the backbone of the monitoring. Inclino-meters and extensometers can be used to record time-dependent deformations in the subsurface. Geodetic measurements, utilizing automatic total stations or GNSS sensors, track movements on the surface. Recently, satellite data has taken on a particularly important role. With radar interferometry (InSAR), large-scale slope movements can be monitored with millimeter precision, and thanks to archived images, they can be analyzed retrospectively. For ski resorts this is a highly cost-effective way to gain an initial overview of critical regions and changing slope and building displacements. For particularly sensitive infrastructure, it is often worthwhile to deploy additional specialized systems. What truly matters is not any individual technology, but how different solutions are intelligently combined and how the available data is interpreted.

### Learning from Canada: Thermosyphons

In Canada, construction in permafrost and the potential impacts of climate change on foundation stability have been a focus for decades. Even though the climatic conditions in the Alpine region differ from those in the Arctic, proven approaches show great potential for the alpine cable car industry. An example of this are thermosyphons. This robust, low-maintenance, and energy-self-sufficient technology was used in this form for the first time at a mountain station in the Alpine region at Piz Nair in the summer of 2025. A total of 17 thermosyphons with roughly 480 meters of total drilling length were installed across three borehole groups, supplemented by ten thermistor strings for monitoring.

The data from the first winter is highly promising, showing that the ground temperature at a depth of about ten meters was locally reduced by more than 2 °C, thereby increasing mechanical strength.

### A new mindset is required

Just as crucial as using the right technology is the mindset applied to planning and operating foundations in permafrost.

Permafrost must be understood as a dynamic, actively managed component of the infrastructure, not as a static subsurface. This requires long-term monitoring from the very beginning, as well as adaptability in design. For instance, passive thermosyphons can later be upgraded into active systems. Close collaboration between operators, engineers, authorities, and researchers is also essential.

If the ski resorts adopts this approach, it can continue to operate its high-alpine installations safely and economically, even in a warmer climate.

*Lukas Arenson, Principal Geotechnical and Permafrost Engineer at BGC Engineering, and Vice President of the International Permafrost Association.*



This is what a part of the thermosyphon looks like after installation.



**Lukas Arenson**  
Principal Geotechnical &  
Permafrost Engineer



Thanks to the Pelton turbine, the Kreuzeckbahn operates on up to 80 percent hydroelectric power. © Bayerische Zugspitzbahn // Bayerische Zugspitzbahn/Brew Media

# ENERGY IN SKI RESORTS

## *Clever Use of Hydropower*

Storing energy, generating electricity, powering cable cars – ski resorts can use hydropower to their advantage. Three destinations demonstrate as examples what is already possible today.

In these uncertain times, energy is not only a cost factor for ski resorts, but also a central corporate risk that must be actively managed. Those who reduce their dependence on the electricity and diesel markets not only increase their ecological credibility, but also strengthen their economic resilience in the long term. A small lever for this is hydropower, with which energy can be stored, electricity produced, and cable cars driven. This is shown by the following examples from the industry.

### POWERING CABLE CARS

The Kreuzeckbahn in the German ski resort Garmisch Classics relies on innovative hydropower. The Pelton turbine newly installed since 2024 above the Kreuzeckbahn valley station uses the overflowing water of the reservoir ponds for environmentally friendly electricity generation. By integrating it into the existing pipelines of the snowmaking system, a resource-efficient solution was created. The green electricity produced in this way flows directly into the drive of the Kreuzeckbahn.

#### Functionality

Former spring catchments run into the Bödele reservoir at an altitude of 1,290 meters. From there, this water flows 470 meters of altitude down to the valley. As it falls, the water hits the blades of the turbine at high speed and drives them. A maximum of between 10 and 35 liters per

second is available. If the level in the lake falls below a certain limit, the turbine switches off automatically. Under good conditions, the Kreuzeckbahn runs on up to 80 percent energy from hydropower. However, only in summer; in winter, the reservoir lake is needed for snowmaking. **Karl Dirnhofer**, Technical Director of Bayerische Zugspitzbahn Bergbahn AG (BZB), would have liked to get more out of it by having the system run only in conjunction with the lift. However, only continuous operation is permitted in order not to disturb the rhythm of the animals.

#### Long, arduous process

But it was a long way until then. It took over 15 years before the turbine could fulfill its task. The Technical Director of the BZB no longer believed in it. The basis is a reservoir lake created in 2007 for the Ski World Championships on the Hausberg. The idea of using this in

summer to generate energy initially failed in 2010 due to high costs and a lack of profitability for the municipal utilities. The turning point came through self-management: BZB later bought up unused water rights and existing pipelines. The project became economically viable because the electricity is now used for their own needs instead of feeding it cheaply into the public grid. However, long approval procedures (2017–2020) and the Corona pandemic delayed construction. The total costs amounted to approx. 250,000 euros. The investment is expected to pay for itself in eight years at the latest, says Dirnhofer: “In times of rising energy prices, the BZB plant serves as a building block for more independence and a better climate footprint.”

### GENERATING ELECTRICITY

Therefore, BZB is also planning to generate its own electricity using a hydropower plant. In doing so, it is following the example of Riesneralm Donnersbachwald. Since 2020, the Austrian ski resort has been operating a snowmaking power plant at the valley station – a project that is regarded as a pioneering achievement for resource-saving energy generation while simultaneously making snow in the Alpine region. The ski resort have already received awards for this and now even appear at international specialist conferences to present the project.



**Karl Dirnhofer**  
Technical Director at  
Bayerische Zugspitzbahn Bergbahn AG





**Angela Haslinger**  
CEO  
Hochkönig Bergbahnen



The visualization of the pumped-storage power plant in Mühlbach/Dienten. © Energie AG

## Functionality

First, electricity is generated with the water from the Donnersbach, and then the water is redirected directly into the snowmaking pipelines in the same building to produce snow.

This saves a large reservoir pond and thus a massive, large-scale intervention on the mountain. With an investment of around five million euros – and a pure hydropower plant built beforehand – around 6.2 million kWh of electricity is generated, which is more than twice as much as the entire ski resort needs for lift operations, catering, and snow-making.

The excess green electricity, enough for over 850 households, is fed into the public energy grid.

## Pioneer: Water without cooling

The ski resort therefore not only covers its own needs but also generates additional income. “To my knowledge, to this day there is no second hydropower plant from which the water is used directly for snowmaking immediately after generating electricity without further cooling,” emphasizes **Erwin Petz**, Managing Director of Riesneralm, highlighting the pioneering character of the project.



**Erwin Petz**  
CEO  
Riesneralm Donnersbachwald

## STORING ELECTRICITY

But electricity can not only be generated and used, but also stored. As part of the planned expansion of the snowmaking system, Hochkönig Bergbahnen (Austria) wants to tackle this topic. Together with the electricity provider Energie AG, the ski resort is building a pumped-storage power plant in Mühlbach/Dienten, which will use the existing Dachegg snow-making pond as an upper reservoir all year round. “The winter sports industry is challenged to find innovative solutions. With this project, we show that climate protection and tourism can go hand in hand,” says **Angela Haslinger**, Managing Director of Hochkönig Bergbahnen.

## Functionality

The planned power plant has a capacity of just under 15 megawatts in turbine operation and 20 megawatts in pump operation. The upper reservoir has a capacity of 180,000 cubic meters, the lower basin has a volume of approximately 100,000 cubic meters. The storage volume allows an operating time for electricity generation of eight to ten full-load hours. The planned drop height is around 550 meters. The pipelines and the reservoir basin, which are used in

winter for the technical snowmaking of the ski slopes, can also be used for electricity storage during energy-rich periods. When needed, the stored energy is fed into the electricity grid.

## The important advantages of the project

Those responsible expect the pumped-storage power plant to provide efficient, year-round use of existing infrastructure and a reduction in necessary interventions in nature; as well as the storage of excess energy and the optimal integration of renewable energy sources. Through the flexible balancing of electricity supply and demand, the power grid will, last but not least, become more stable.

## Project status

The enlargement of the Dachegg reservoir pond from currently 70,000 to 180,000 cubic meters has already been officially approved. Work is currently underway on the technical preliminary project. Energie AG has concluded an agreement with Hochkönig Bergbahnen for the use of the snowmaking pond. The project is to be submitted by summer 2026. Following approval, the ground-breaking ceremony could take place as early as 2027.



The hydropower plant of the Riesneralm generates more electricity than the ski resort requires.



© Riesneralm



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InteralpIn brings together international exhibitors, decision-makers and experts from the alpine technologies and cable car sectors in Innsbruck.

## INTERALPIN: CONTINUES TO EXPAND ITS INTERNATIONAL NETWORK

Following a dynamic spring – highlighted by City Cable Car Solutions 3CS at Mountain Planet in Grenoble and a showcase at the NSAA Convention in California – preparations for InteralpIn 2027 are in full swing. From April 20 to 23, the industry will gather once again at Messe Innsbruck.

Over the past few weeks, InteralpIn has further expanded its international network. With *City Cable Car Solutions 3CS*, the new conference format for urban cable car mobility was successfully continued at Mountain Planet in Grenoble.

Shortly afterwards, InteralpIn was represented at the NSAA National Convention & Tradeshow in Carlsbad, California, and used this North American industry gathering to exchange ideas with

international partners and to further strengthen its long-standing and successful collaboration with the National Ski Areas Association (NSAA).

### **3CS is developing into an international thematic platform**

The second edition of *City Cable Car Solutions 3CS* brought together international experts from transport operators, planning, academia, politics and industry in Grenoble. The focus was

on specific projects, scientific findings and strategic approaches to integrating cable cars into urban transport systems. Practical examples such as Câble 1 in the Paris region and Téléo in Toulouse demonstrated how urban cable cars can be successfully integrated into existing mobility concepts. The programme was complemented by a guided tour of Mountain Planet, where the latest technological developments and solutions for urban use were presented.



© SI/Thomas Surrel



© Île-de-France Mobilités

As part of City Cable Car Solutions 3CS 2026 in Grenoble, international experts discussed developments and prospects for urban cable car transport.



**International engagement with the North American market**

With its presence at the NSAA National Convention & Tradeshow, InterAlpin also underlined its close ties with the North American market. During the event, InterAlpin project manager **Stefan Kleinlercher** met with NSAA President and CEO, **Mike Reitzell**. The discussion focused on continuing the long-standing partnership and further international exchange in the run-up to InterAlpin 2027.

“The past months have once again shown just how important face-to-face interaction is within the international industry. Whether at City Cable Car Solutions in Grenoble or at the NSAA Convention in the USA: such platforms forge valuable connections and provide important impetus for the further development of InterAlpin. Together with our partners, we are already working intensively on the next edition in 2027,” emphasises InterAlpin project manager Stefan Kleinlercher.

**Preparations for InterAlpin 2027 are underway**

The next InterAlpin will take place from 20 to 23 April 2027 at Messe Innsbruck (Exhibition Centre). Alongside the international market leaders in alpine technologies, trade visitors can once again look forward to a comprehensive supporting programme. It will feature the Austrian Cable Car Conference, the InterAlpin Inspiration Days, City Cable Car Solutions 3CS, and accompanying events such as the Inter-Alpine Natural Hazards Conference (INAC). Following its successful debut, INAC will once again bring together experts from science, infrastructure and industry.



Mike Reitzell (NSAA, left) and Stefan Kleinlercher (InterAlpin, right) met during the 2026 NSAA National Convention & Tradeshow to discuss the future of their international cooperation.

Around 650 companies are expected to showcase their products, services and the latest global innovations in alpine technologies and ropeway systems at InterAlpin 2027. The exhibition will cover a broad range of topics, including:

- Passenger transport systems,
- Winter maintenance equipment for municipal and private use,
- Alpine construction,
- Leisure and recreational facilities,
- Technologies for the construction, maintenance and marking of ski slopes, cross-country trails and ice rinks,
- Ticketing systems, software and access control,
- Snowmaking technologies,
- Alpine safety, rescue and protection,
- Communication, radio and monitoring systems and much more.

InterAlpin attracts a highly international professional audience. In 2025, more than 60 percent of registered visitors travelled from abroad, while Messe Innsbruck recorded registrations from 131 countries. Representatives came from established markets such as the United States, France, Italy, Japan and Canada, as well as emerging markets including South Korea, Kazakhstan, Romania, Argentina, Uzbekistan and Chile.

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+43 (0) 512 53830



36,800 international visitors from over 130 countries used InterAlpin 2025 as a platform for exchange, innovation and initiating investment projects.

## JAPAN: VIP cabins with dining tables



Niseko Village in Japan has announced a major upgrade to its gondola lift system, scheduled to open in December 2026. Replacing the long-serving Mori-no Chair, which has carried skiers since the early 1980s, the new Morino Gondola will feature sleek cabins that double transportation capacity while cocooning passengers in warmth and comfort. Divided into two sections with an intermediate station, the gondola is designed for all-weather performance, able to operate even when summit conditions grow severe. Among its 86 cabins, four VIP versions offer tables for light dining, while two glass-floor cabins



deliver a thrilling new perspective on Niseko's snow-draped terrain. When the first section is completed in December 2026, guests will be able to ride from base to the intermediate station. With the completion of the second section in December 2027, the gondola will connect seamlessly from base to summit – without requiring a change of cabins. Guests can choose to disembark at the intermediate station or continue upwards, tailoring their journey to snow quality, weather, and personal skill level. The Wonderland Chair will also see a significant upgrade, moving from single to two-person lifts.

## GOLD HUNT IN FINLAND: Ski resort hides 20,000 euros



The Finnish ski resort Levi launched an extraordinary summer campaign for its guests: they were invited to search for a hidden gold treasure worth 20,000 euros under the Arctic midnight sun. The 'Midnight Sun Hunt' started on June 18, 2026, and ran until the end of August 2026. It took participants through the landscapes of Levi, guided by a series of clues. The treasure hunt challenged participants to solve puzzles and follow trails that gradually revealed the exact location of a hidden gold bar. Although the prize could theoretically have been found after the first clue, each new hint released throughout the summer made locating the hiding place easier. The hunt was specifically designed to encourage exploration of the region while showcasing the unique character of the Arctic summer."

© Pixabay

## VAIL RESORTS unveils new plan to transform the ski experience

Vail Resorts has announced a multi-year plan aimed at improving the ski experience across its resorts. The "Epic Experience" plan focuses on improving every stage of a ski holiday. A key part of the initiative is Epic Ascent, a premium private lesson programme launching at Vail Mountain and Beaver Creek, offering guests a more personalised service and premium rental options. The company will also continue upgrading its rental experience through My Epic Gear, allowing guests to select specific equipment models in advance. Another focus is enhancing the on-mountain dining experience with upgraded menus. At the same time, digital services will be expanded through the My Epic app, including easier pass purchases. In addition, the company invested \$175 million in wages and benefits to build a world-class team.

## POLAND: New alpine coaster opened at former ski lift site



Szczyrk Mountain Resort in Poland has opened a major new summer attraction for visitors: the Salamandra Alpine Coaster, a modern year-round gravity coaster located in the Beskid Mountains. The new attraction was built on the site of a former ski lift. Adventure seekers can enjoy a thrilling track stretching nearly 750 meters through the mountain landscape. The ride delivers a true roller-coaster experience, with sleds first racing just above the treetops before moments later soaring up to 15 meters above the ground. The route features a series of spectacular elements, including 360-degree and 720-degree turns, as well as wide curves and rapid changes of

direction. Although the Salamandra Alpine Coaster can reach speeds of up to 40 km/h, each rider can adjust the pace individually using the built-in braking system. The two-seater sleds, inspired by the colors and appearance of the fire salamander, are designed to be enjoyed by both families and couples, offering a unique year-round adventure in the heart of the Beskids. Safety was also a key focus in the design of the system: The safety harnesses cannot be released during the ride. In addition, an intelligent distance control system automatically maintains a safe gap between sleds, eliminating the risk of collisions on the track.

© Szczyrk Mountain Resort



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