

## SERRE CHEVALIER: A LEADING SKI AREA IN RENEWABLE SELF-CONSUMPTION

Ski resorts have a key role to play in the energy transition and climate change mitigation. Some ski areas have started to produce renewable energy. In the French Alps, the Serre Chevalier ski area has launched the "EnR by Serre Chevalier" programme, with the objective of achieving 30% self-consumption of renewable energy by 2023.

### The weight of electricity consumption in ski resorts

The Alps are home to 36% of the ski resorts and 84% of the major ski areas, attracting some 20 million skiers each year who generate an annual turnover of 40 billion euros ([Smart Altitude](#) project). Rising temperatures and decreasing snow cover raise questions about the role of ski resorts in adapting to and mitigating climate change. In response, projects such as [Smart Altitude](#) and [TranStat](#) aim to support resorts in their transition.

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The energy consumption of resorts is an essential lever for mitigation, especially as mountain infrastructures are becoming more and more energy intensive. In the Alps, the electric power of ski lifts increased fourfold between 1980 and 2017 ([Environmental Atlas of ski resorts and resort support municipalities](#)). Generally speaking, in France, the electricity consumption in municipalities that support ski resorts is twice as high as the national average. In the resorts where snow sports can still be practiced, the energy transition is therefore crucial to mitigate the impact of ski areas on climate change but also to reduce the resorts' energy bills.

### A renewable mix of 3 energy sources

The ski area of Serre Chevalier began its [energy transition](#) in 2018 in order to mitigate climate change. The transition is based on 3 energy sources: solar, wind and hydraulic.

Buildings and lift stations were equipped with photovoltaic panels in 2018. In total, 1722 m<sup>2</sup> of panels are installed on 27 existing buildings. Thanks to a good sun exposure, with an annual average of 300 days of sunshine, as well as the sun's reverberation on the snow, photovoltaic panels represent a total of 27% of the ski area's renewable energy production. These favourable conditions allow Serre Chevalier to produce 10% to 25% more energy than originally estimated by the supplier.



Serre Chevalier also uses wind power. Two small wind turbines less than 12 metres high are installed on the top of the slopes, on an experimental basis. At the moment these installations represent a very small share of the ski area's energy production. However, this makes Serre Chevalier the first ski area to test the use of wind turbines at an altitude of 2,400 metres and the experimentation could help improve existing technologies.

Finally, Serre Chevalier is banking on hydroelectricity to become the resort's main source of renewable energy. A hydroelectric plant is installed on the artificial snow network and a second one will be added in November 2023. As they are installed on existing infrastructure, the impact on the surrounding mountain landscape is minimal.



### 30% of renewable energy self-consumption by 2023

The energy installations in the Serre Chevalier ski area produce 4.5 gigawatts annually, equivalent to the annual consumption of 2,000 inhabitants. The energy produced by photovoltaic and wind power is consumed by the ski area, in particular to power the ski lifts, machine rooms and snow guns. Due to its low storage capacity, hydroelectric energy is not self-consumed but sold and fed back into the electricity grid.



Credits Thibaut Durand

While renewable energy represented only 0.63% of the ski area's consumption in 2018, this share rose to 28% in 2022. The objective is to reach 30% in 2023 and eventually 50% in the long-term.

These objectives are part of a more global low-carbon strategy, which also includes low-carbon objectives for transport. In fact, at Serre Chevalier, emissions from snow groomers account for 95% of the total emissions.

### Governance and resources

The installation of photovoltaic, wind and hydroelectric infrastructures required an investment of 3.6 million euros. The project received support from the “Caisse des Dépôts” and the South Region, as part of the 2015-2020 Mountain Plan.

Due to their innovative aspect, some installations required more investment. For example, a budget of 100,000 euros was required to carry out a feasibility study regarding the installation of a hydroelectric power plant to harness the power of the water flowing in the artificial snow network.

#### Innovative aspect

Serre Chevalier has successfully engaged in climate change mitigation by developing ambitious energy installations in just a few years. The initiative takes advantage of existing buildings and structures, reducing the impact on the landscape and biodiversity. In addition, experimenting with new technologies such as wind power at high altitudes and hydro power on the artificial snow network, can advance new energy production techniques in the high mountains. For these reasons, the Serre Chevalier ski area has been awarded the [EUSALP Energy Award 2022](#).

