

## Press release

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### Floating solar farm on Lake Toules

## First ever high-altitude solar farm delivers initial findings

**Three years after coming into service, Romande Energie has published the initial results from the first ever high-altitude solar farm. Located on the reservoir created by the Toules dam (Bourg-St-Pierre/Valais canton) at an altitude of 1,810 metres, this pioneering prototype is providing lessons for future projects needed in the urgent transition to clean energy.**

The commissioning of this solar farm in December 2019 came after a decade of research by the Romande Energie Group in conjunction with the Swiss Federal Office of Energy (SFOE). These initial results have now been analysed and reported to the SFOE.

Overall, the prototype solar farm has met the expectations of the Romande Energie Group. The purpose of this installation, which precedes the large-scale installation, was to verify the technical and financial feasibility of the project. Consisting of a 2,240m<sup>2</sup> array of bifacial panels mounted on 35 floating structures, the prototype has successfully overcome several hurdles, including adapting to water level variations of as much as 15 meters at the prototype's location on the reservoir. Based on the dam's annual operating cycle, the structure is grounded for close to 6 months every year. It also has to withstand the extreme weather conditions typical of an altitude of 1,800 metres, namely snow, ice, wind gusts of up to 120 km/h and temperatures ranging from -25°C to 30°C.

### Results and lessons learned from the prototype project

Over the past three years, Romande Energie has operated the prototype to determine the viability of this type of installation on a larger scale. The energy yield in alpine environments and the potential environmental impact were both studied.

#### Generation

Pilot tests between 2013 and 2019 suggested a 50% increase in power generation compared to plateau levels. From this data, the annual yield was estimated at 1,800 kWh per installed kWp. The actual result averaged 1,400 kWh, representing an increment of only 30%.

This difference can be explained by the fact that the authorities put a premium on winter production at the expense of the total annual production as well as by prototype-related limitations. Notably, the floating plant was located further south and therefore closer to the mountains than the ground-based structure tested during the feasibility studies. The result was additional shade from the mountains and from other panels nearby, leading to up to one hour of lost sunshine exposure per day. In addition, snow – and especially drifting snow – caused a few days of downtime each year and also damaged approximately ten of the photovoltaic (PV) panels. The prototype is being adapted to prevent snow accumulation in a process similar to the installation of windbreakers this past winter.

In the large-scale project, the array is planned to cover approximately a third of the lake surface, offsetting the effects of mountain shadow on overall output. The positioning of the panels will be adapted to limit shade from adjacent rows as well as snow accumulation. The risk of drifting snow build-ups will be minimised once detailed analysis has been completed. Technological advances in PV panels and panel tilt angles will also be considered in advance to increase generation output.

Thanks to the lessons learned, the large-scale array should theoretically be able to achieve the 50% production increment relative to the plateau level. However, total annual production is likely to fall slightly short as winter generation will be prioritised.

### **Impact on the environment and landscape**

Environmental analysis has shown that there has been no impact on fauna and flora since the reservoir is artificial and emptied yearly. The installation also benefits from existing facilities (reservoir, access road, electrical infrastructure) as it is integrated into an existing production site (dam), which in turn limits the impact on the landscape.

### **Romande Energie's positioning in high-altitude solar industry**

Fully aware of the need to speed up domestic energy production in Switzerland, Romande Energie is heavily involved in the development of renewable energies, particularly solar energy. In addition to rooftop arrays, it has for years been exploring new avenues and technologies related to photovoltaic production. Yet the Group believes that large-scale PV development in alpine environments should not be pursued at the expense of the environment or the landscape. Consequently, it is focusing on projects in milieu where man-made structures already exist so that synergies can be developed. This decision was the result of lengthy deliberations, supplemented by discussions with various stakeholders including government authorities and environmental associations, and reflects the Group's business philosophy based on its three pillars of sustainable development (economic, social and environmental).

### **What next?**

The experience gained during the prototype phase will enable Romande Energie to develop a more efficient large-scale installation that can be fine-tuned to overcome the various problems encountered on the test model.

“We believe in the full-scale project and also have plans to develop solar farms on other alpine reservoirs in Switzerland,” said Guillaume Fuchs, Joint Head of the Energy Solutions business unit at Romande Energie. These solar farms are part of the equation for achieving energy independence for Switzerland, especially in winter.”

Scheduled for 2024-2028, the large-scale plant floating on Lake Toules is set to cover one-third of the surface and produce over 22 million kilowatt hours annually, representing the average consumption of 6,200 households. The project meets the criteria of new federal legislation (Spatial Planning Act and Energy Act) and could also qualify for subsidies.

In the meantime, research into the prototype is ongoing. From this spring, Fraunhofer ISE measuring devices will be fitted as part of the research institute's PV4Resilience project. Romande Energie's installation was selected because it is the only high-altitude floating solar installation in the world.

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## Romande Energie at a glance

The Romande Energie Group, the leading electricity supplier in Western Switzerland, is a mainstay in the domestic energy industry. It offers a range of sustainable solutions for the distribution and generation of electricity as well as energy services, including energy efficiency and e-mobility solutions.

All of its generation assets are powered by renewable energy sources. Through this, its innovative services and its sustainability policy, the Group is helping customers, investors and employees to achieve ever-improving standards of living. Romande Energie works every day to provide its customers with the high quality of service and security of supply they expect and to help them make the transition to more sustainable forms of energy to reduce the carbon intensity of Western Switzerland.

**For more information, visit**

[www.romande-energie.ch](http://www.romande-energie.ch)