Handeck 1 – KWO's first hydroelectric power plant

PIONIEERING BEGINNINGS

The year 1908 marks the start of the successful history of KWO. This was a time when pioneering engineers visited the Grimsel region and recognised its enormous potential for hydroelectric energy production. The first dam was built in 1925, making it the world's highest dam at this time. Far-sighted entrepreneurship and innovative thinking enabled the engineers to successfully transform water power into hydroelectric energy. This pioneering way of thinking still underpins continuous innovation at KWO along with a solid commitment to sustainability.

Grimsel Hydro – Hydroelectric Competence Centre

GOALS INTO ACTION

One of Switzerland's primary goals within its Energy 2050 Strategy is to reduce energy-related environmental impact. Thanks to its large hydropower plants in the Grimsel region, KWO is already making a significant contribution towards the achievement of this goal. All projects have been planned to align with this strategy, which includes optimising the existing infrastructure, expanding storage capabilities and actively contributing to grid stability. KWO makes long-range investments based on its unique development and history.

Gauli Waterfall – a thunderous force of nature

HARNESSING NATURE

The Grimsel and Susten region not only boasts breathtaking scenery but a magnificent energy resource. Here, the power of water is harnessed and turned into energy. KWO combines its tried-and-tested machinery with modern technology to boost energy production at short notice according to demand. Alpine hydroelectricity plays a key role in stabilising the electricity grid by balancing out fluctuations in the supply of solar energy and wind power and providing fast, efficient and emission-free energy.

Brown trout in the KWO's residual waterway

ENVIRONMENT FIRST

Nature and technology form a symbiotic relationship in the Grimsel and Susten area. Using the power of water for energy production depends on nurturing a positive relationship with Mother Nature. KWO is Switzerland's first hydroelectric company with its own department of ecology that focuses on biodiversity and landscape conservation. This means legal requirements concerning the protection and enhancement of downstream water bodies are always met, which ensures energy production in this area can be classified as sustainable.

Oberaarbahn – once built to transport heavy loads, it is now a popular tourist attraction

FACTS, FUN, ADVENTURE

KWO's power plants are a great place to visit for people who love to learn and are seeking fun and adventure. During a visit to the region, you can take a ride through the labyrinth of tunnels, shafts and caverns, and observe the huge turbines and generators. This is a fun way to acquire a better understanding of hydroelectricity generation and the technology behind it. Not only can you enjoy a range of subterranean adventures, but there is also plenty to do above ground. You can enjoy a ride on historic funiculars and visit the reservoirs and interesting feats of engineering such as the Triftbrücke suspension bridge. The historic alpine hotel, the Grimsel Hospiz, is also well worth a visit.

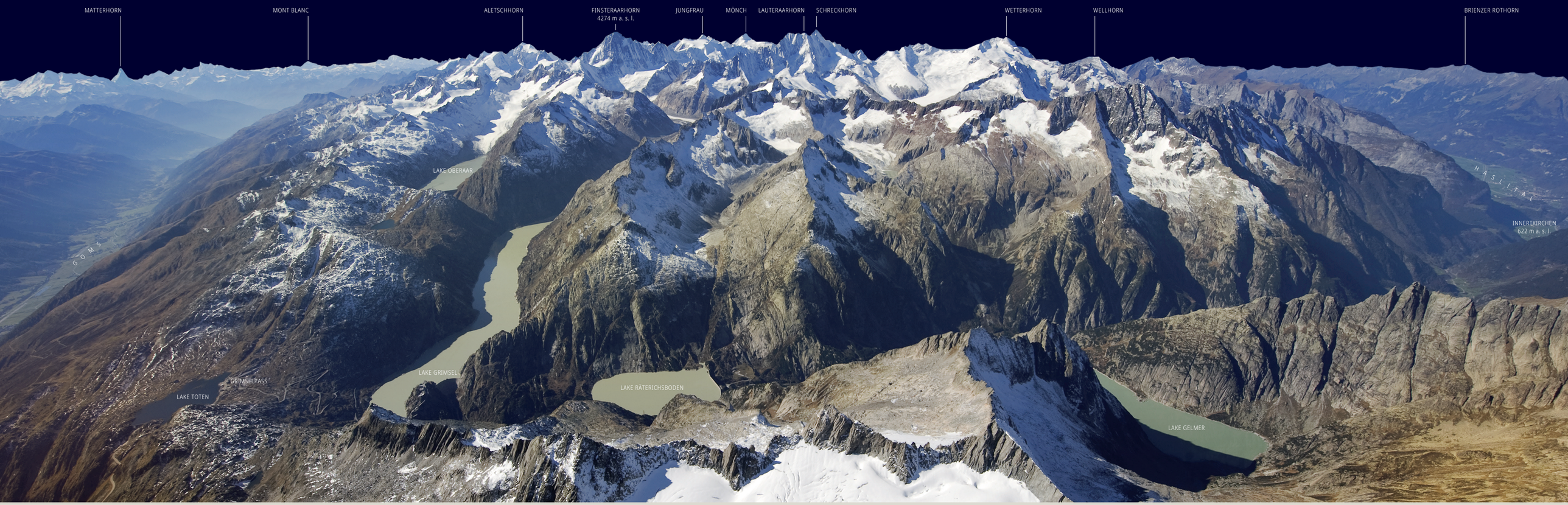
Guttannen – an attractive and lively place to visit

ALPINE ROOTS

KWO is deeply embedded in the unique alpine region of Oberhasli. The company could not see itself operating a nyway else. An abundance of water and optimal geological and altitude conditions make it the perfect location for energy production. KWO is one of the region's largest employers and plays a key role in its socio-economic development.

Hydroelectricity in harmony with nature

AM PULS DER WASSERKRAFT
SEIT 1925
KWO
GRIMSELSTROM



189

million cubic metres of water. This is how much water can be stored in the eight KWO reservoirs. This is equal to the amount of water used per year in the homes of just under four million people living in Switzerland.

1317

megawatts of installed power. This is the capacity of all 13 KWO power plants with their 28 turbines. This impressive figure is necessary to ensure that exactly the right amount of electricity is generated to meet current demand. Thanks to the use of high-performance pumps, KWO can store energy by pumping water to a higher reservoir.

2200

gigawatt hours of electricity. This is the amount of energy produced by the 13 KWO power plants every year. This is usually peak and regulating energy, which is provided exactly when the consumers need it. The amount of electricity generated is equal to that used per year in the homes of around one million people living in Switzerland.

160

kilometres of tunnels. Most of KWO's infrastructure is barely visible as it is hidden deep inside the Grimsel granite, including the power plant caverns, surge tanks, water tunnels, pressure shafts, tunnels for transporting energy and access tunnels for the power plants.

434

employees (306 full-time positions) work at KWO. Employment opportunities range from roles in power plant technology all the way through to tourism. These diverse work opportunities are extremely valuable for the mountainous Oberhasli region.

15

apprentices in 11 different professions. We have a wide range of apprenticeship positions on offer in professions as diverse as electricity production, tourism, mountain railways, the hotel business and hydroelectric technology.

Power Plants

		Installed turbine output in MW	Installed pump output in MW
1	Fuhren	10	4
2	Hopflauenen	87	
3	Innertkirchen 2	54	
4	Innertkirchen 3	3	
5	Innertkirchen 1	240	
6	Innertkirchen 1A	154	
7	Handeck 1	44	
8	Handeck 2	124	
9	Handeck 2A	91	
10	Handeck 3	55	48
11	Grimsel 1	66	
12	Grimsel 2	388	392
13	Grimsel Nollen	1,5	
	Total	1317,5	444

Reservoirs

		Storage volume in million cubic metres
1	Lake Oberaar	57
2	Lake Trübten	1
3	Lake Grimsel	90
4	Lake Toten	2
5	Lake Räterichsboden	23
6	Lake Gelmer	13
7	Lake Mattenalp	2
8	Lake Engstlen	1
	Total	189

Planned projects

1. Trift reservoir and power plant
2. Handeck 4 power plant
3. Grimsel 4 power plant
4. Expansion of Lake Grimsel
5. Expansion of Lake Oberaar

Transportation

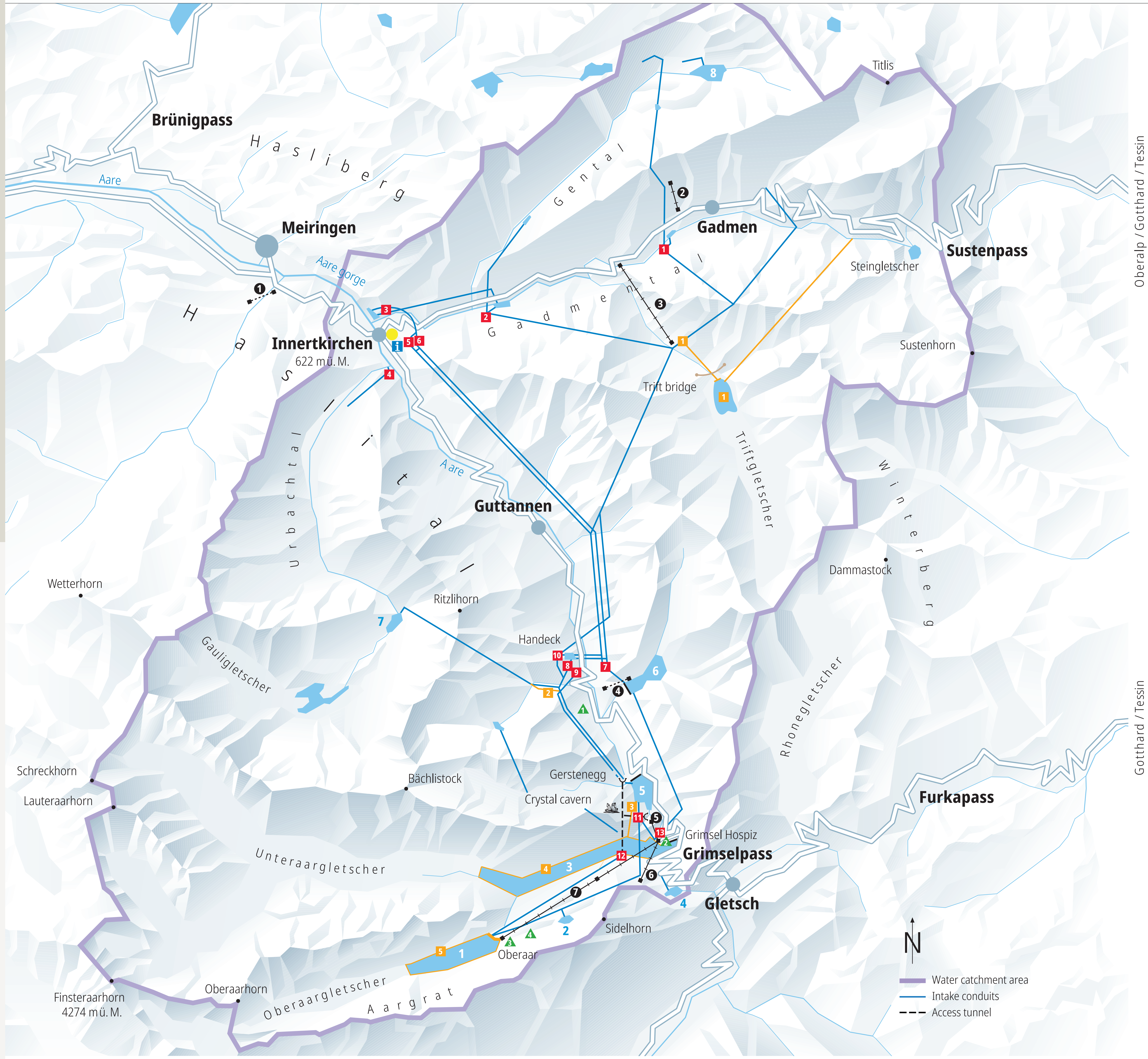
1. Reichenbach Funicular
2. Tälli Gondola
3. Trift Gondola
4. Gelmer Funicular
5. Hospiz Gondola
6. Sidelhorn Gondola
7. Oberaar Gondola

Grimselhotels

1. Handeck – Hotel and Nature Resort
2. Hospiz – Historic Alpine Hotel and Visitor Center
3. Oberaar – Restaurant and Berghaus
4. Bäregg – Bäregghütte alpine hut

KWO headquarters / Grimsel Hydro

Interactive site map



Visualisation of the Trift reservoir (KWO, Birri / Ormerod)

Expanding storage capacities

980 million cubic metres of precipitation fall per year in the KWO catchment area, of which KWO uses around 700 million cubic metres for generating power. However, it can currently only store around a quarter of annual precipitation in its reservoirs, so the remainder flows away as runoff water. With the new Trift reservoir and the expansion of Lake Grimsel, KWO is aiming to utilise the storage potential of 485 gigawatt hours for the winter. This will contribute significantly towards the achievement of the Swiss Energy Strategy 2050 goals and support flood protection measures right down to Lake Brienz.

Trift reservoir and power plant

Expansion of Lake Grimsel

Stabilising the power grid

A strength of KWO is its ability to reduce the stress on the power grid in sunny and windy conditions and pump water into higher reservoirs. If power demand should increase, the stored energy can be made available again to consumers quickly according to need. Thanks to the flexible infrastructure, large reservoirs and good geographic location, KWO can respond to fluctuations in the power grid at the touch of a button and stabilise the grid in critical situations.

Optimising existing plants

For almost a century, KWO has been building, successfully maintaining, inspecting and enhancing hydroelectric power plants. By making appropriate investments, KWO uses clever ideas to exploit the full potential of the existing infrastructure and constantly optimises the existing power plant system. This leads to consistent improvements in energy efficiency and performance.

Associated divisions of KWO

Grimsel Hydro

At the hydroelectric competence centre, Grimsel Hydro consolidates various skills and offers its services on the market.
www.grimselhydro.ch

GRIMSELWELT
Wo die Energien fliessen

Grimselwelt incorporates the tourist offerings connected to electricity production. These include the Grimselhotels, railways and tours.
www.grimselwelt.ch

Founded
1925

Share capital
120 million Swiss francs

Shareholders
50 % BKW Energie AG
16 ⅔ % Industrielle Werke Basel
16 ⅔ % Energie Wasser Bern
16 ⅔ % Elektrizitätswerk der Stadt Zürich

BKW
IWB
ewb
ewz

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