Grimsel 2 – one of Switzerland's largest pumped storage hydro plant

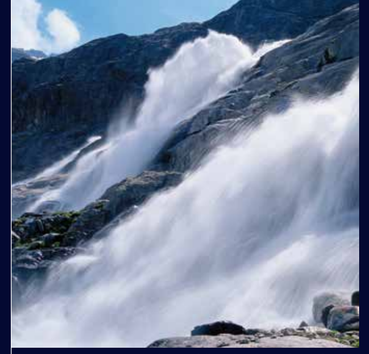
PIONIEERING SPIRIT

The year 1908 marks the start of the successful history of the Oberhasli hydroelectric company KWO. It was the time of temerarious and pioneering spirited engineers visiting the Grimsel area and recognising its enormous potential for hydroelectric production. The first dam was built in 1925 – at that time it was the world's highest dam. Far-sighted entrepreneurship and innovative thinking enabled the engineers to successfully transform water power into hydroelectric energy. This pioneering way of thinking still functions as basis for continuous innovative processes, always bound to a commitment of sustainability.

Grimsel Hydro – Hydroelectric competence centre

ZEST FOR ACTION

Moving towards renewable energy is Switzerland's top strategy to ensure a successful energy transition. The highly productive plants in the Grimsel region enable the KWO to make a contribution to this superordinate goal. Several innovative projects are ready to be carried into execution – in order to increase the facilities' efficiency, production and storage volumes. Bearing its own history in mind, investments by the KWO are always planned in a long-term horizon.



Gauli Waterfall – a thunderous force of nature

THE POWER OF NATURE

The Grimsel and Susten region offers a breathtaking scenery and at the same time highly energetic surrounding. This is the place where the power of water is turned into energy. The interaction between trusted machinery and modern technology enable the KWO to boost its production at short notice, if required. Alpine hydroelectricity plays an important part in stabilizing the electricity grid during times when the erratic production of solar energy and wind power needs to be balanced – expeditious, efficient and emission-free.

Brown trout in the KWO's residual flow reach

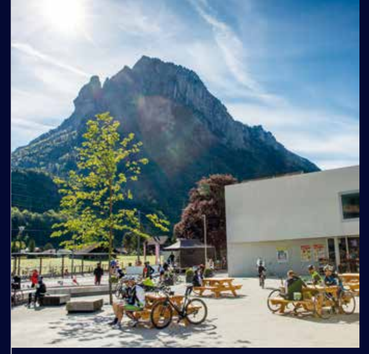
PARTNERSHIP

Nature and technology form a symbiotic relationship in the Grimsel and Susten area. Using the power of water for energy production depends on a favourable relationship with Mother Nature. The KWO is Switzerland's first hydroelectric company with its own department of ecology; biodiversity and landscape conservation are only two examples of the department's core business. Implementation of legal requirements concerning the protection and upgrading of the downstream waterbodies is always guaranteed. Therefore, the energy production in this area can be considered as sustainable.

Gelmer funicular – once built for heavy loads, nowadays a tourist attraction

ADVENTURE

The KWO's power plants are open to inquisitive visitors. Take a ride through the labyrinth of tunnels, shafts & caverns, and observe the turbines and generators! Acquire some better understanding about the production of hydroelectricity and its technology. In addition to this unique underground world, more highlights await to be discovered on the surface. The gondolas and historic funiculars bringing visitors to the reservoirs, the Trift suspension bridge or the Historic Alpine Hotel Grimsel Hospiz, just to name a few.



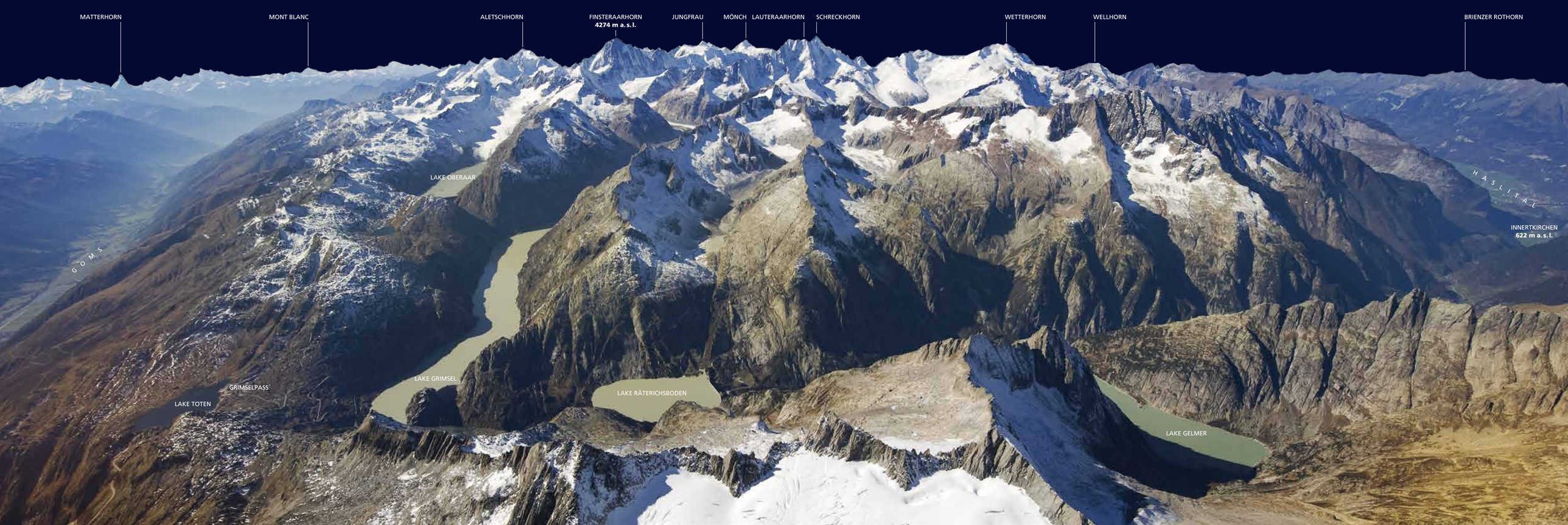
Grimseltor Innertkirchen – Village Centre with Tourist Center

ALPINE REGION

Not for anything in the world would the KWO move away from this very unique place. The KWO is heavily connected to the mountainous world of the Oberhasli region. This is the only place where the natural supposition for a successful energy production is given: an abundance of water, and the geology and inclination are just right. Being one of the region's largest company (and therefore employer), the KWO is deeply embedded in the socio-economic environment of the region and is committed to regional development.

Hydroelectricity goes hand in hand with nature

KWO
GRIMSELSTROM



Power Plants

		Installed turbine output in MW	Maximum pump output in MW
1	Fuhren	10	5
2	Hopflauenen	94	
3	Innertkirchen 2	62	
4	Innertkirchen 3	3	
5	Innertkirchen 1	255	
6	Innertkirchen 1 E	154	
7	Handeck 1	50	
8	Handeck 2	136	
9	Handeck 2 E	91	
10	Handeck 3	55	56
11	Grimsel 1	67	
12	Grimsel 2	392	363
13	Grimsel Nollen	1	
	Total	**1370**	**424**

Reservoirs

		capacity in million cubic metres
1	Lake Oberaar	57
2	Lake Trübten	1
3	Lake Grimsel	94
4	Lake Toten	2
5	Lake Räterichsboden	25
6	Lake Gelmer	13
7	Lake Mattenalp	2
8	Lake Engstlen	1
	Total	**195**

Expansion projects

1. Trift Reservoir and Power Plant
2. Handeckfluh Power Plant
3. Grimsel 1 E Power Plant
4. Grimsel 3 Power Plant
5. Enlargement Lake Grimsel
6. Replacement Spitallamm Dam

Transportation

1. Meiringen-Innertkirchen-Train (MIB)
2. Gelmer Funicular
3. Trift Gondola
4. Tälli Gondola
5. Handeck–Gerstenegg Gondola
6. Oberaar Gondola
7. Sommerloch Gondola
8. Sidelhorn Gondola
9. Reichenbach Funicular

Grimsel Hotels

1. Hotel and Nature Resort Handeck
2. Historic Alpine Hotel Grimsel Hospiz Visitors' Centre
3. Restaurant and Mountain Lodge Oberaar
4. Holiday and Alpine Hut Bäregg

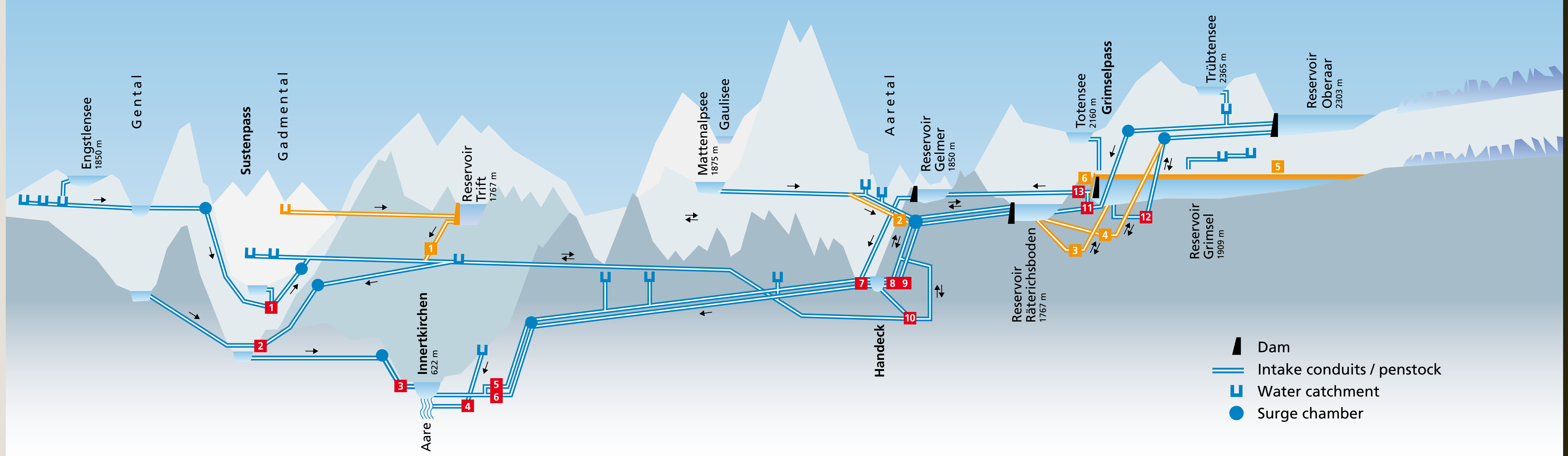
KWO head office / Grimsel Hydro

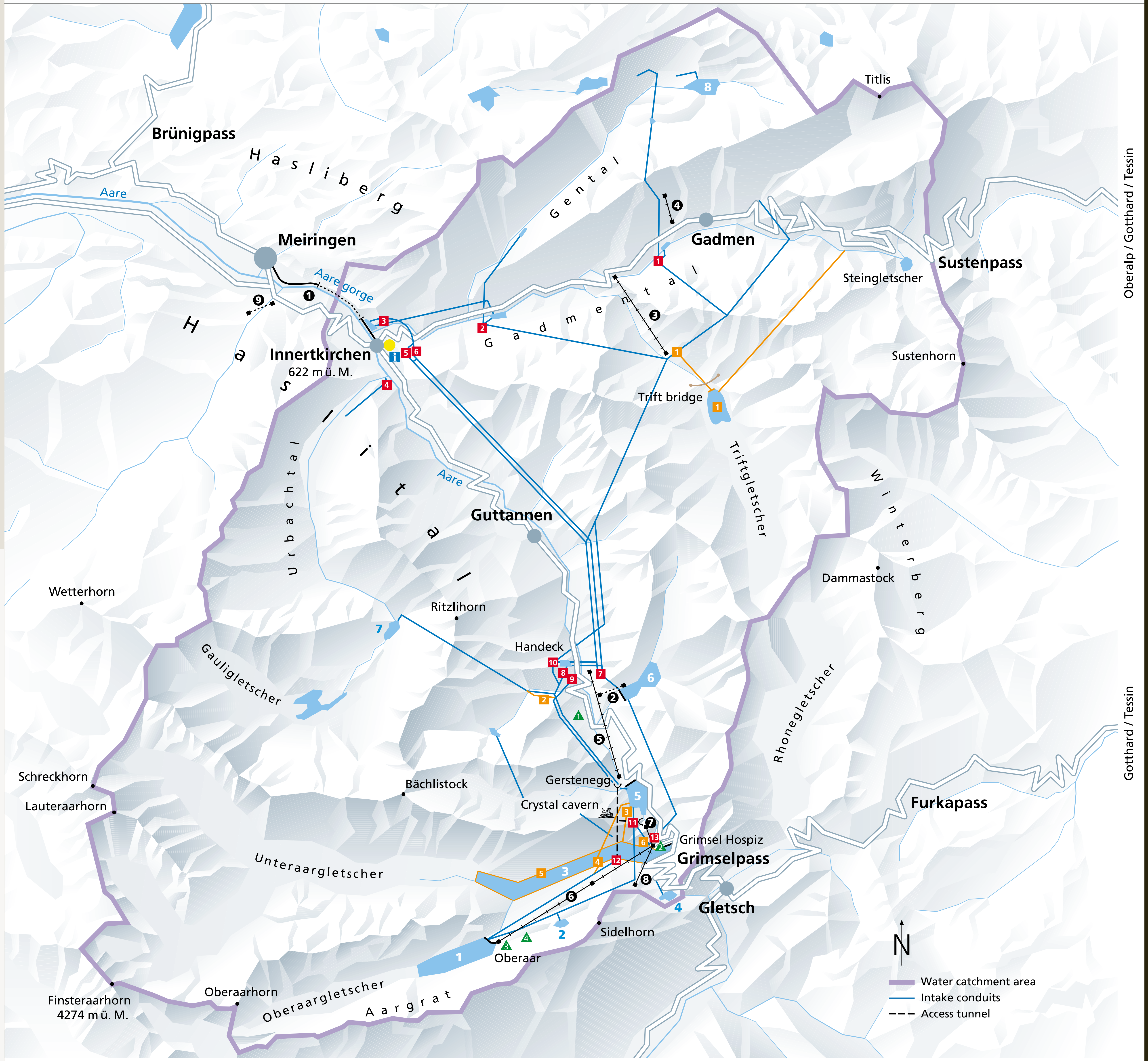
Founded
1925

Equity Capital
120 million Swiss Francs

Shareholders

50 %	BKW Energie AG
16⅔ %	Industrielle Werke Basel
16⅔ %	Energie Wasser Bern
16⅔ %	Stadt Zürich





Nufenen / Brig / Lausanne

1

percent of Switzerland's area. This is the size of the catchment area "Innert dem Kirchet". On this area of 450 km², 980 Million cubic meters of water accumulate annually, of which we use 700 millions for our power generation. The Finsteraarhorn is the highest point at 4274 m a.s.l., whilst Innertkirchen represents the lowest point at 622 m a.s.l. Thanks to this difference in elevation, the water gains the force to drive the enormous turbine wheels within the power plants.

195

million cubic metres. This is the amount of water, which can be stored within the eight reservoirs of the KWO. This energy storage corresponds to the same amount of water used by almost 4 million Swiss residents per year in their own household.

1370

megawatt installed capacity. This is the amount of energy produced by 28 turbines within thirteen power plants. This enormous capacity is inevitable in order to provide the amount of energy needed at any particular time. The KWO has the possibility to store energy thanks to its powerful pumps, which are able to transport water back to higher reservoirs.

2400

giga watt-hours of electricity. This amount of energy is produced annually by the KWO's thirteen power plants, generally as peak load and regulating energy – produced at the time when it is most needed. This output is equal to the annual energy consumption of a good million Swiss residents in their own household.

1 235 450

cubic metres of concrete. This gigantic amount of concrete was necessary to build the KWO's eight dams, which are cumulatively holding back 195 000 000 cubic meters of water. The amount of concrete in relation to the storage volume equals 0.63 %.

The Grimsel Dam is the KWO's highest, with 114 m height. At the time of its completion in 1932, this dam was the highest in the world for a short time.

160

kilometres of tunnels. Most of the KWO's facilities are not visible on the surface as they were built and are now located below surface, surrounded by Grimsel granite – machine hall, surge tanks, penstocks, head- and tailraces and access tunnels are all hidden, underground.

360

employees (275 full-time) are working for the KWO. The wide range of professions vary from hydroelectric to touristic occupations. This diversity of jobs is exceptional and very valuable to the alpine region of the Oberhasli.

23

apprenticeship positions. The KWO offers an exceptional wide range of apprenticeships. Polytechnician, auto mechanic, facility caretaker, specialist for funiculars, designing engineer, office administrator or touristic professions are just a few to be named.

Associated divisions of KWO

Grimsel Hydro
Technologiezentrum Wasserkraft
Understanding hydropower and implementation of solutions according to customer requirements
www.grimselhydro.ch

GRIMSELWELT
Wo die Energien fliessen
Tourism services surrounding hydroelectricity and water power
www.grimselwelt.ch

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