

Rjukan - Notodden as World Heritage Sites?





In 2014 the Norwegian government will submit an application for Rjukan Notodden to be inscribed on UNESCO' list of World Heritage Sites.

This is because of the significance role these places played in the development of hydroelectric power, the development of process industries and the production of artificial fertiliser, a product a hungry world craved. The industrial story started at the beginning of the 1900s and made a substantial contribution to Norway's increasing prosperity. From being one of the poorest nations in Europe at the beginning of the 1900s, Norway has become one of the very richest 100 years later. In the first half of the 1900s it was the energy-intensive industries, especially the process industry, that made the most significant contribution to this. In the second half of the 1900s, the oil industry took over and carried this development further. The principle that natural resources are publicly owned has always been fundamental, in terms of both hydroelectric power and oil. There are approximately 1,000 objects on Unesco's World Heritage List around the world. It is the desire of the global community to preserve these objects for mankind. To be inscribed on this list an object must be of 'outstanding universal value'. Being inscribed on Unesco's World Heritage List is a mark of quality and confers significant status.

Rjukan



Waterfall power

Hardangervidda plateau is Northern Europe's largest high mountain plateau and covers an area of around 8,000 km². It is the precipitation that flows eastwards from the enormous catchment area that laid the foundation for power station development in upper Telemark at the beginning of the 1900s. Sam Eyde acquired the rights to Rjukanfossen waterfall in February 1903. The company A/S Rjukanfos was founded in April of the same year. Møsvatn was regulated in 1905. In 1907, work commenced on Vemork power station. When it was completed in 1911 it was the largest power station in the world. The construction of Saaheim power station started in 1913. This was completed in 1915. Subsequently, Norsk Hydro built Frøystul power station, Moflåt power station and Mæl power station. The five power stations along the Maana river system have a total fall height of around 700 metres. Total power production constitutes today almost 4% of the total hydroelectric power production in Norway.



The factories



Construction of the factories in Sålheim (known as Rjukan from 1912) in Vestfjorddalen Valley started in the summer of 1907. On July 12th of the same year, Sam Eyde gave his final approval to the extensive plans for the utilisation of Rjukanfossen waterfall. In 1911 the first load of artificial fertiliser rolled out of the Rjukan factories. Up until 1928, the Birkeland/Eyde process was used in the production of artificial fertiliser. In 1928 the Haber/Bosch process was utilised instead. At its peak, the Norsk Hydro Rjukan factories had almost 1,800 employees. In 1963 the Norwegian Parliament approved an extensive reduction in production at the Rjukan factories. At the same time, approval was given to transfer the electrical power to the company's factories at Herøya in Porsgrunn. The workforce in Rjukan was halved. Throughout the 1960s, 70s and 80s, continuous reductions were made in Rjukan. In 1991 the very last load of artificial fertiliser rolled out of the Norsk Hydro Rjukan factories.

The transport artery



The Rjukan Line (built 1907-09) is the transport artery that had to be built in order to convey artificial fertiliser from the small community of Rjukan, deep within the county of Telemark, and out to the world market. The railway line from Rjukan to Notodden (50 km), as well as the ferry berths at Mæl and Tinnoset, were built in one and a half years – by 1,400 navvies. King Haakon VII opened the Rjukan Line on 9th August 1909. In 1911 the line was electrified and thus became Norway's first full gauge electric line. The Rjukan Line's last ordinary train ran in 1991. Stiftelsen Rjukanbanen (The Rjukan Line Trust) assumed responsibility for the line when it was closed by Norsk Hydro. Today, the whole system forms part of the Norwegian Industrial Workers' Museum at Vemork. DF 'Ammonia' and MF 'Storegut', the two ferries on Lake Tinnsjøen, were listed by the Directorate for Cultural Heritage in 2009. The Tinnos Line was listed in 2011 and in 2013 the Rjukan Line and the factory areas in Rjukan and Notodden were listed.

Rjukan Town



From 1907 to 1920 a town to accommodate 10,000 inhabitants was built in Vestfjorddalen Valley, deep within the county of Telemark. Sam Eyde had a very strong interest in architecture. He therefore engaged the most prominent architects in Norway. In addition to housing, schools, a hospital, church, assembly house, barn for 150 dairy cows, as well as a number of other essential service institutions worthy of a modern town were built. Quality was key. For example, after 1912 not a single house was built without a WC.

In 1928, Norsk Hydro built Krossobanen. This was the very first cable car in Northern Europe. The reason for building the cable car was to allow people to reach the mountains in order to enjoy the sun. Satisfied workers were efficient workers. Perhaps Krossobanen is the most significant HSE measure in the history of Norway?

Notodden



Professor Kristian Birkeland's ground-breaking invention for obtaining nitrogen oxide from the air through the use of electricity is the most important invention of all time in Norway. The nitrogen oxide was extracted in the so-called Birkeland-Eyde furnace. This was developed between 1903 and 1905, primarily in Froland and Notodden. The method made it possible to manufacture calcium nitrate on a large scale.

Notodden was the actual pioneering location for the realisation of this invention. Eyde and Birkeland required large amounts of electrical power. Tinfos power station had been built as early as 1901, and it was here that the two industrial builders were offered a very favourable leasing agreement by Tinfos owner O.H. Holta. Among its benefits was access to 5,000 natural horsepower in order to build a research factory in 1905. The founders also obtained the rights to utilise Tinfos' barges on favourable terms for goods transport to and from Skien/Porsgrunn. Further, Sam Eyde, together with the two Swedish industrialists and financiers Marcus Wallenberg and Knut Tillberg, was given the opportunity to acquire Svelgfoss waterfall. Here they developed a power station that produced more than 35,000 natural horsepower. This provided the basis upon which to build a factory for full scale production of ammonium nitrate (Norway salpetre) in Notodden, a factory that was commissioned in October 1907.

It was the energy agreement with Tinfos that formed the basis of Sam Eyde's establishment of Norsk Hydro-Elektrisk Kvælstofaktieselskap (Norsk Hydro) in December 1905, with its head office in Notodden.

As early as 1903, Sam Eyde had acquired the enormous Rjukanfossen waterfall, located at the very top of the same river system as Svelgfoss waterfall. The long term goal was to realise the development of the giant waterfall. The successful experiments and developments in Notodden made this goal highly viable. Now it was just a question of getting started, as quickly as possible. A resolution on the development of Rjukan was passed on 4th July 1907.

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