

Electrification of the Čadca district with an emphasis on water saws and mills [1]

Mgr. Martin Dominik Hrtus

Historical Laboratory of (Electro)Technology, Faculty of Electrical Engineering, Czech Technical University in Prague (FEE CTU in Prague), Technická 2, CZ-166 27 Prague 6

hrtusmar@fel.cvut.cz

Abstract. *The following paper aims to approach the process of electrification of the political district of Čadca in the period 1918 - 1950, mainly in terms of its impact on water saws and mills. It examines not only the course of electrification and its legislative anchoring, especially in the Electrification Act of 1919. It focuses on the specifics of electricity spreading as a source of lighting and propulsion into the production process of water saws and mills, which were an important part of the district economy. It also points to several specific factors that have prevented these companies from being fully electrified.*

Keywords

Economic history, electrification, water saws, water mills, Czechoslovakia, Slovakia, Čadca

1. Introduction

The introduction of electricity into the production process of sawmills and mills was undoubtedly one of the most important modernization impulses, not only in the Kysuce region but in the whole of Czechoslovakia. The first, unsystematic phase of electrification in the vicinity of Čadca took place in the period before the First World War. The source of electricity was the two local largest industrial plants: the textile factory of the Baize factories in Žilina (Súkenné továrne v Žiline) and the steam saw of Leopold Popper, which, in addition to the production facilities themselves, also supplied electricity to the city of Čadca. [2] However, the state of electrification in Kysucie was low until 1918, which corresponded to the nationwide situation, when only 2.2 % of municipalities had access to electricity. [3]

2. Systematic electrification of the Čadca district

The systematic electrification of the Czechoslovak Republic began with the adoption of the so-called Electrification Act in July 1919.[4] However, the Act on the Support of Rural Electrification of 1926 was of greater importance for the territory of agrarian Slovakia.[5] In the case of Kysuce, this was in practice reflected in the interconnection of the distribution networks of the United Power Plants of northwestern Slovakia (Spojené elektrárne severozápadního Slovenska) and the Moravian - Silesian Power Plants (Moravsko-sliezske elektrárne). Their connection, formed by the so-called very high voltage highway, passed through the territory of Kysuce, and in 1931 Čadca was connected to it.[6] The majority of the region's population was located in the area between Čadca and Makov, which was electrified in 1932, thus creating ideal conditions for the further use of electricity, not only in the economic sector. However, during the ongoing Great Depression, not enough funds were found to complete the electrification of these municipalities, which eventually did not take place until the turn of the 1930s and 1940s.



Fig. 1. Čadca district in the 1930s. The population was concentrated along the river Kysuca between the municipality of Makov and the town of Čadca. The name of the whole region is based on this river.

Another retarding factor in the expansion of electricity was its relatively high local cost. The local Business Association (Okresné živnostenské spoločenstvo) [7] has become a mediator in negotiations between consumers and the United Power Plants of northwestern Slovakia.[8] The talks were supported by a series of public demonstrations and protests to reduce electricity consumption. This last step proved to be the most effective. Two years after the start of negotiations, it was agreed to reduce the price for light current from CZK 4 / kW to CZK 3.70 / kW and for motor current from CZK 2.20 / kW to CZK 1.90 / kW. [9] Even this price did not suit the self-employed even, as the average national tax per 1 kW of light current was CZK 3.24.[10] However, other objections and attempts by the trade community to intervene were not successful and electricity consumers by the end of the period under review were paying one of the highest prices in the country. The electrification process nevertheless continued, and by January 1947, 74 % of the municipalities in the district had been electrified. This share far exceeded the national average of 40 %. [11]

3. Electrification of sawmills and mills in the district of Čadca

In the sawmilling and milling industry electricity had three uses. As a source of lighting, for larger sawmills and mills as the main source of propulsion, and for smaller companies with a water motor as an auxiliary source of propulsion during periods of insufficient water flow. The major development in terms of safety has been the introduction of electric lighting, which has significantly reduced the risk of fire in these very dusty working environments. Electric motors alone continue to reduce this risk compared to steam or wooden gas auxiliary engines. They also have an immediate power output that does not require a long start-up process. They are easy to operate, and when placed directly next to grinding and machining tools, they allow them to operate selectively and eliminate dangerous uncovered transmissions and pulleys. Their main disadvantage is, of course, the need for a source of electricity. These facts led to the so-called local electrification, in which electricity was produced and

consumed directly in mills and less often in sawmills. The original water engine (water wheel and especially the water turbine) served as the primary input energy source, and the energy produced in this way served mainly for lighting. In the Czech lands, this process began in the period before the First World War and continued into the 1920s, when it was followed by systematic electrification. The situation was different in Slovakia. The overall economic and technical backwardness led to the state in which these local sources of electricity were present in much smaller quantities, even after 1918. Before they could expand, systematic electrification began to connect water saws and mills to a standardized distribution network.

We can also observe this sequence of events in the Čadca district. The first water-powered business to start using electricity was the mill in Turzovka, which belonged to the Chromík family. The classic mill equipment was rebuilt in 1924 into a roller mill, which, however, needs more stable and higher revolutions for operation. The wooden topwater wheel was replaced by a Bánki's turbine, which also powered an electric generator. Later, it was taken over by the United Power Plants of northwestern Slovakia as a power plant. Its water turbine was the only turbine installed and at the same time the most powerful water engine in the district.[12] After 1924, there was probably no electrification of any equipment that would use its own water engine to produce electricity. When examining the state of electrification of other objects, we come across a discrepancy between archival sources and secondary literature, or a vague definition of the electrification of the object. For example, in his article, Miroslav Sabol ranks the saws of Hugo Frankl and the Cisárik brothers in Turzovka, together with the saw of Alexander Duda, among the electrified with a fully electric propulsion.[13] Hugo Frankl's saw was located on the site where, according to the First military mapping, a sawmill and a mill stood side by side. Those disappeared by the 1880s, which we can tell by the Third military mapping. Frankl has held a trade license to operate a water and steam sawmill since 1933. [14] The issuance of the permit was also accompanied by a decision for permitting the construction of a steam engine boiler room. Even after the steam engine commissioning, the water drive was still used, as the water channel was rebuilt and an entry was made in the Water Book. [15] Available archival documents do not mention the use of electricity.



Fig. 2. The location of future Hugo Frankl's water-saw as pictured on the map sheet of the First military survey.



Fig. 3. The same location in the 1880s. Only the building of a saw is remaining.

Alexander Duda's sawmill also combined steam and water propulsion according to the materials of the Business association.[16] However, we can assume the use of electricity for both saws, at least for lighting purposes. They were located in electrified parts of the municipalities, in the case of sawmill A. Duda even close to the terminal railway station.

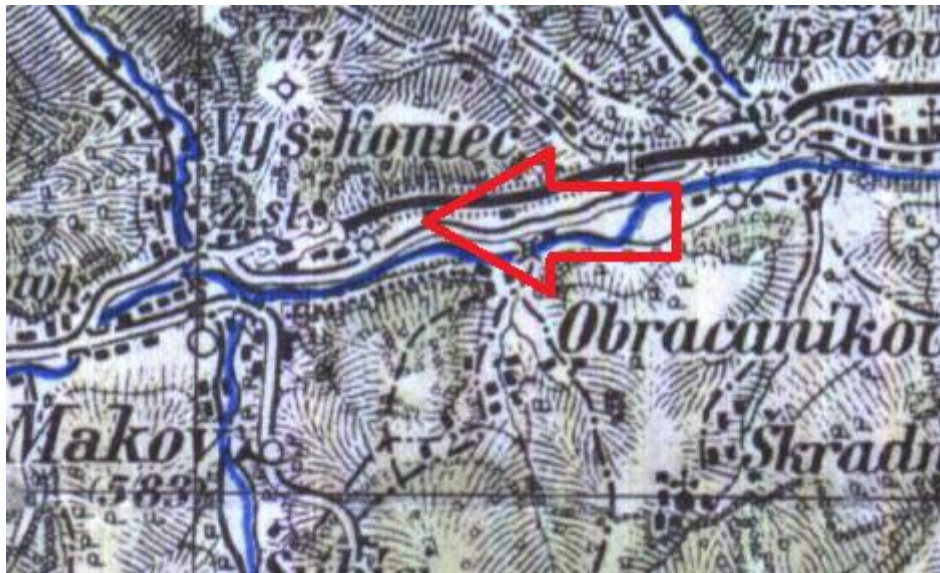


Fig. 4. The saw of Alexander Duda in Makov, next to the railway station, as seen on the German General Staff map during the 1940s.

The sawmill of the Cisárik brothers in Turzovka does not fall within the focus of the original research, as it never used hydropower during its operation. However, I mention it as an example of a specific electrification process, which is evidenced by sufficient archival evidence.[17] It was built in 1938 on a hitherto undeveloped plot of land in the center of Turzovka in the immediate vicinity of the railway station, ie in an electrified area. The company with a capacity of 8,000 m³ of logs annually further processed part of the finished lumber into barrels, chisels, and simple furniture. Due to this energy-intensive secondary processing of wood raw material, it differed from regional water saws. These manufacturing processes required several machine tools for which individual electric propulsion was ideal. Probably due to its high price, the saw did not take it from the distribution network but had its own steam engine with a generator.[18] From the classification point of view, its categorization as electric or steam saws is therefore questionable.

The discrepancy between the requirements of water saw owners for the use of electricity and the real progress of electrification can be demonstrated in the last two facilities. Ján Chribík built the first sawmill in Vysoká nad Kysucou in 1941, which was completely converted from water to electricity. However, the electrification of the village did not take place according to the planned schedule and the sawmill is listed in the 1943 inventory as non-functional, without an energy source.[19] The owner of another sawmill in Turzovka, Vincent Hrtus, also planned to use electricity as an auxiliary source of propulsion. However, as his building was located about 500 meters from the nearest line, he decided to build a self-made connection. As can be seen in the attached photograph, he even erected several poles, but subsequently ran out of funds and the sawmill thus remained water-powered until it ceased operations in 1952. But the construction attempt alone suggests what benefits the sawmill owners have seen in electric power.



Fig. 5. The water-saw of Vincent Hrtus in Turzovka in the second half of the 1930s. The picture shows two self-assembled poles of the unfinished power line. The immediate surroundings of the saw are not electrified to this day. Author's private collection.

The geographical and climatic conditions of the Čadca district are not favorable for crop production, therefore in the observed period, the mills were of less economic importance than the sawmills. The sources document the only electrified object, Viktor Gramer's mill in Čadca.[20] However, the electric drive here enabled such modern and economical production that it was the only mill whose operation was not ceased in the 50s, and in 1951 it was incorporated into state mills industry (n.p. Považské mlyny). [21]

4. Conclusion

The electrification of the Čadca district, despite the overall economic backwardness of the region and the overall delayed start in Slovakia, in comparison with the Czech lands had favorable conditions, as its territory was crossed by a long-distance power line, coming from the industrial area of Silesia. This potential has not been fully exploited due to the higher price of electricity and the restriction of its distribution to the centers of larger municipalities. However, electricity was an attractive source of primary or auxiliary propulsion for the abovementioned businesses and a significant impetus for modernization. Research on the electrification of Slovakia with emphasis on its social aspects is the topic of the author's planned doctoral thesis. This POSTER is the first, shorter output in the research.

Acknowledgements

This paper was supervised by prof. PhDr. Marcela Efmertová, CSc. of Historical Laboratory of (Electro)Technology, Faculty of Electrical Engineering, Czech Technical University in Prague (FEE CTU in Prague), Technická 2, CZ-166 27 Prague. The author would like to thank her for this supervision.

References

- [1] The paper is based on the author's final master's thesis. HRTUS, M. D. *Vodné pily a mlyny v okrese Čadca v rokoch 1918 – 1950*, master's thesis, UHSD, Prague 2022, 100 p.
- [2] GERÁT, Rudolf. *Čadca v premenách času*. Čadca 2010, p. 78.
- [3] SABOL, Miroslav. *Nosný priemysel na Kysuciach v prvej polovici 20. storočia*, in: HALLON, Ľudovít –JESENSKÝ, Miloš –SABOL, Miroslav et al., *Kysuce v XX. Storočí*, p. 87.
- [4] Zákon 438/1919 Zb. Z a n. RČS ze dne 22. července 1919 o státní podpoře při zahájení soustavné elektrisace. <https://www.beck-online.cz/bo/chapterview-document.seam?documentId=onrf6mjzge4v6nbthaxhazrfuya> (quoted 6.3.2022)
- [5] Zákon 139/1926 Zb. Z a n. RČS ze dne 1. července 1926 O finanční podpoře elektrisace venkova. <https://www.aspi.cz/products/lawText/1/4213/0/2/zakon-c-139-1926-sb-o-financi-podpore-elektisace-venkova/zakon-c-139-1926-sb-o-financi-podpore-elektisace-venkova> (quoted 6.3.2022)
- [6] SABOL, Miroslav. *Elektrifikácia severozápadného Slovenska v prvej polovici 20. storočia*, in: JESENSKÝ, Miloš (ed.) *Zborník Kysuckého múzea v Čadci 13/2010*, Čadca 2010, p. 373.
- [7] District business associations were self-governing economic organizations, which were established based on the Trade Act no. 269/1924. See HRTUS, Martin Dominik *Záujmové spoločenstvo a jeho vplyv na vývoj podnikateľského prostredia regiónu na príklade Okresného živnostenského spoločenstva v Čadci*, in: *Hospodárske dejiny*, volume . 35, number. 3, Prague 2020, p. 349 – 355.
- [8] The power company was founded in Žilina in 1922. It was one of five power companies with the right of a public beneficiary in Slovakia, which was established after the adoption of the Electrification Act.
- [9] Archive Čadca, branch of the State archives in Žilina. Fond OŽSČ , zápisnica č. 156 valného predstavenstva OŽSČ z 15. februára 1934.
- [10] *Maloobchodní ceny životních potřeb, indexy životních nákladů a indexy potravinové v letech 1921 – 1936*, Praha 1938, p. 85.
- [11] SABOL, Miroslav. *Nosný priemysel na Kysuciach...*, s. 98.
- [12] *Seznam a mapa vodních děl republiky Československé: Stav k roku 1930*, Sv. 21, Prague 1933.

[13] SABOL, Miroslav. *Nosný priemysel na Kysuciach...*, p. 101.

[14] Archive Čadca, branch of the State archives in Žilina. ŠA ZA pobočka CA, Fond OŽSČ, Register slobodných živností, entries from 1933.

[15] Archive Čadca, branch of the State archives in Žilina. Fond Okresného úradu Čadca, kartón 239, spis Stavba vodnej pily.

[16] Archive Čadca, branch of the State archives in Žilina. Fond OŽSČ, Register obchodných živností 1931 – 1951, entries from 1934.

[17] Archive Čadca, branch of the State archives in Žilina. Fond Okresného úradu Čadca, kartón 286, spis Evidencia píl v okrese.

[18] Ibidem.

[19] Ibidem.

[20] Archive Čadca, branch of the State archives in Žilina. Fond ONV Čadca, kartón 5, spis: Mlyny v okrese.

[21] Ibidem.

About Author...

Mgr. Martin Dominik HRTUS is a graduate in Economic History at the Institute of Economic and Social History, Faculty of Arts, Charles University in Prague. In 2018, he completed a four-month internship at the Armenian National Museum in Yerevan. He is employed as an assistant at the Historical Laboratory of (Electro) Technology, Faculty of Electrical Engineering, Czech Technical University in Prague, where he also began his doctoral studies in February 2022. The topic of his planned dissertation is the social aspects of electrification in Slovakia.