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# SUMMARY

## *Methods for optimising electricity costs*
## *in the aspect of dynamic changes on the energy market*

Electricity is a commonly used source of energy in all industries. With rising energy prices and an unstable energy market, it was necessary to develop a tool to optimise electricity-related costs. Indeed, rising electricity prices lead to increased inflation, as the price of energy is a cost that will be passed on to the final price of the goods and services being offered.

The literature review and experience made it possible to clarify a few basic conclusions, which became the main motivation to take up the subject in question. These included the still low awareness of market mechanisms among electricity consumers and the lack of institutional support in this area, as well as the lack of instruments and tools independent of sales and distribution companies to support optimisation decisions.
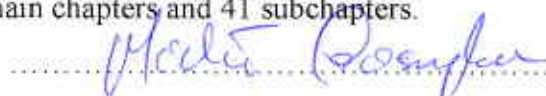
The dissertation performed a holistic analysis of the Polish electricity market and identified factors influencing and shaping electricity prices. Opportunities and areas for cost-free and low-cost reduction of electricity-related costs incurred by enterprises were identified.

As part of the dissertation, a unique tool, previously unavailable on the Polish market, was created. In an automated manner, it optimises contracted power and tariff groups for the distribution and sale of electricity. The optimisation process is carried out on the basis of actual measurement data containing the demand profile for active and reactive power of the facility, in the billing period under analysis. With its help, the customer can make calculations using any tariffs and charge rates.

The programme was developed in the MATLAB environment with a graphical GUI interface. However, it can be successfully transposed to another programming environment. Optimisation and calculations are performed according to the author's algorithm, which was created during the realisation of the dissertation.

The dissertation presents an analysis of the calculation results for three real and representative cases of business customers. For each of them, by optimising the level of contracted power and tariff groups, measurable financial savings in electricity expenditures are achieved.

The dissertation consists of 155 pages, 11 main chapters and 41 subchapters.

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