

Coal fired power plant 150 MW, Tkibuli, Georgia

Project: Coal fired power plant 150 MW, Tkibuli, Georgia

Client: GIEC – GEORGIAN INTERNATIONAL ENERGY CORPORATION

Year: 2014

Client considered building of new 100-150 MW coal fired plant near the town Tkibuli to strengthen Georgian energy security and to promote economic development of the area. ŠKODA PRAHA provided the feasibility study for this project with following main objectives:

- to identify possible technical solutions for desired power plant, to compare and to recommend the best suiting technology option
- to describe general power plant concepts and systems
- to analyse local electricity market
- to summarize technical economic data and evaluate return of investment in relation to off-take tariff (power purchase price)

For intended purpose natural circulation single drum pressure system with reheat and 150 MWe condensing steam turbine was proposed. Steam rate approx. 450 t/hour with superheat temperature 570°C and pressure 13,9 MPa was considered.

Consequently ŠKODA PRAHA provided detail technical economic evaluation of various possible technical solutions for most expensive process systems to choose the most beneficial variants. Regarding burning technologies suitable for available coal and required output - circulating fluidised bed (CFB) and pulverized coal boilers were compared. CFB technology was selected, which avoided necessity of installation of additional denitrification and desulphurisation equipment. For heat rejection induced draft cooling towers were recommended. Except detail evaluation of main process systems ŠKODA PRAHA provided conceptual technical solutions and technical specifications of all other auxiliary systems.

Analysis of local electricity market was included as well. The analysis showed that under the given assumptions the existing generation capacity together with projected new hydro power plants will cover the domestic consumption of Georgia up to 2020s even if Tkibuli thermal power plant will not be built. However, considering the high export potential of the Georgian energy system, improvement of strengthen of energy security and avoiding necessity of importing electricity during summer, construction of the plant is beneficial.

To analyze the feasibility of the project a financial model by forecasting cash flows on invested capital for 30 year (end of plant life) was developed. The cash flows included investments in construction and commissioning of the plant, expected revenues, operating expenses, maintenance expenses and required working capital. The analysis was provided in cooperation with local partner – Deloitte Georgia. The study defined and justified the value of off-take tariff necessary for project to become profitable.