

**ABSTRACT****Computer Applications For Optimization of  
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Optimization of the use of energy is vitally important in the context of the conservation of diminishing resources. This complex task is beyond our ability to perform without the use of modern computers. The numerical power to have energy systems operating optimally, on a continuous basis, is now at hand. The intricacy of the task, however, is formidable.

An examination of the problem is presented, starting from the model for the non-linear energy system and the development of a solution, using the classical gradient methods. These methods favour convex problems, with smooth elliptical hypercontours of the objective functions. This is looked at in the context of practical systems, where distortion of the hypercontours occur due to inequality constraints and the introduction of penalty functions for constraint violations. The application of computers in solving such problems, using modern methodologies including the use of parallel processing architectures, is looked at, and in the process, some insight into the nature of non-linear systems, in general, is given.