Due to the limited range of today's electric vehicles, it is important to lower the energy consumption for these vehicles. This can for example be achieved by employing an energy management system. Most research in this field focuses on strategies for individual components and only some literature exists on holistic energy management concepts. This paper presents an optimization-based holistic energy management system. The strategy is currently developed within a simulation environment and will, in the future, be adapted to a usage in existing vehicles. To demonstrate the feasibility of the concept, a hybrid genetic algorithm is implemented. By adjusting the velocity for each spatial discretization step and the air conditioning unit's power for each time step of a driving cycle, the total energy consumption, traveling time, and cabin temperature are optimized. The results show that the energy consumption can be considerably reduced, while keeping the driver comfort well within acceptable limits and the driving time constant.