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Sommario/riassunto	Various experimental techniques have been advanced in recent years to measure non-equilibrium energy transformations on the microscopic scale of single molecules. In general, the systems studied in the corresponding experiments are exposed to strong thermal fluctuations and thus the relevant energetic variables such as work and heat become stochastic. This thesis addresses challenging theoretical problems in this active field of current research: 1) Exact analytical solutions of work and heat distributions for isothermal non-equilibrium processes in suitable models are obtained; 2) Corresponding solutions for cyclic processes involving two different heat reservoirs are found; 3) Optimization of periodic driving protocols for such cyclic processes with respect to maximal output power, efficiency, and minimal power

fluctuations is studied. The exact solutions for work and heat distributions provide a reference for theoretical investigations of more complicated models, giving insight into the structure of the tail of work distributions and serving as valuable test cases for simulations of the underlying stochastic processes.