This thesis is focused on the assessment of impacts of the regulatory uncertainty related to the EU Emission Trading System (EU ETS) on investment decision-making of power generators. The need for investments in new power generation capacities that would be capable to satisfy in the future the growing electricity demand is currently a discussed topic on the Czech as well as on the EU level. These investments are endangered by the uncertainty regarding the future development of the EU ETS regulatory framework, which is a major price driver of the tradable emission allowances. This thesis uses the real option model to analyze the impacts of potential future developments of the emission allowance prices on the investments into new power plants and identifies the regulatory uncertainty as one of the major causes, why investors postpone the investment into the construction of new sources. The analysis is embedded into a broader framework depicturing the EU ETS and the impact assessment procedure conducted by the European Commission.