ANALYSIS OF SYSTEM DYNAMICS ON POWER STRUCTURE EVOLUTION UNDER THE CONSTRAINT OF ATMOSPHERIC POLLUTANT EMISSION REDUCTION

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Since 2012, the air pollution problem of China is getting worse. The state environmental protection administration decided to control the coal consumption strictly and reduce the proportion of coal-fired thermal power to adjust the structure of electric power. Power structure adjustment is a complex dynamic evolution process, which concerns many fields such as policy and planning related to energy and environmental protection, economic development, power input-output, resource exploitation and utilization, and energy price. so it has obvious nonlinear characteristics. Considering that system dynamics has the advantages of integrity and dynamics on the analysis of complex problems, this paper sets up a complete system dynamics model by analysing the pollution emissions, input-output, and the parameters of thermal power, hydropower, nuclear power and new energy power generation with constraint of atmospheric pollutant emission to seek the applicable approach and conditions to meet the pollution emissions target.

The main contents of this paper are as follows Part 1: to briefly introduce the relationship between atmospheric pollutant emission and power generation, and review the energy development planning and policy of pollution emissions. Part 2: to focuse on analyzing the capacity development planning and pollutant emission coefficient of thermal power, hydropower, nuclear power and new energy power generation. Part 3: to set up a complete system dynamics model of power structure with constraint of atmospheric pollutant emission control. Part 4: to simulate the power structure in 2017 and 2020 based on the above model using related statistics. Finally, by analysising the simulation results arrive the conclusion and propose relevant suggestions.