

THE USE OF THE VERHULST LOGISTIC FUNCTION AS A DESIRABILITY FUNCTION TO NORMALIZE THE NATURAL GAS SUPPLY SECURITY INDICATORS

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Natural gas supply security indicators differ from each other according to their nature and measurement scale; have different measurement units and value ranges. They are normalized and assessed by means of several methodical approaches using different quantitative and qualitative assessment scales.

The absence of unified methodical approaches to the quantitative and qualitative assessment of the core natural gas supply security indicators, their interpretation and comparison make certain problems in the determination of the energy security level. Special difficulties on this subject arise in the solution of multi-criterion tasks on aggregation of specific series into a unified composite index of the natural gas supply security.

To solve multi-criterion tasks on the formalization of composite indexes, several methods of their construction are used. One of the most known methods is the use of the generalized Harrington's desirability function that is widely applied in relevant researches but results in the use difficulties due to its cumbersomeness.

That is the reason why the article justifies the possibility of use of the Verhulst logistic function as a desirability function to normalize the natural gas supply security indicators, which is more convenient in use and secures a proper accuracy level of the research given.

At the same time, the use of numerical desirability scale, which has grades in golden section proportions, is proved to be applied for assessment of several fractional indicators of the natural gas supply security as well as for assessment of the unified composite index of the natural gas supply security, which is made up of specific fractional indicators of the natural gas supply security.

The use of the proposed methodical approach empowers the normalizing of specific fractional natural gas supply indicators, which differ in their nature and measurement scale, by means of the unified assessment scale.

The proposed approach opens the way for the formalization of the generalized composite natural gas supply security index, consisting of normalized fractional natural gas supply indicators, which is the subject of further researches by the author.