Development of the Ecological, Energy and Economic Efficiency Index of Firefighting and Emergency-Rescue Vehicles Exploitation Process and Selection of a Rational Way to Take into Account the Phenomenon of Inflation when Determining its Monetary Components

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Abstract. The research deals with the selection of rational units of monetary equivalents expression of the fuel values and ecological damage costs in the structure of Prof. Igor Parsadanov's complex fuel and ecological criterion as environmental safety level indicators of the exploitation process for emergency and rescue vehicles with reciprocating internal combustion engine. The main results of the study have been obtained and substantiated by means of comparative calculation. To consider the phenomenon of inflation, it has been proposed to use the mathematical apparatus of the customer price index and it has been suggested to describe the dynamics of change in the index for US Dollar over time by polynomial of the third degree using the least squares method. The differences in the monetary cost values can be interpreted as a part of the methodical component of the resulting systematic error when this criterion is applied. A new vector-based approach for conducting a comprehensive, criteria-driven assessment of indicators reflecting the environmental sustainability level of the given process has been proposed, using the decarbonization index *DCI* as its foundation. It contains the RICE thermal pollution criterion *K* in its structure, and provides for obtaining the Index of Ecological, Energy and Economic Efficiency *4EI* as a mixed product of three vectors. One of them defines the cost equivalents while accounting for inflation; specifically, it incorporates the product of the discount rates i2 and i4 as a function of CPI. This approach makes it possible, firstly, to account for current decarbonization trends, including the role of thermal energy and greenhouse gas emissions, and secondly, to conduct assessments across all stages of the life cycle except the initial one – «Design and Production».

Keywords: Environment Protection Technologies, Power Plants, Reciprocating Internal Combustion Engines, Firefighting and Emergency-Rescue Vehicles, Criteria-Based Assessment, Motor Fuel Consumption, Monetary Equivalents, Inflation, Costumer Price Index, Discount Rates.