



“Gheorghe Asachi” Technical University of Iasi, Romania



A NEW SIMPLE INDEX FOR THE ESTIMATION OF ENERGY IMPACTS ON THE ENVIRONMENT

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Abstract

A new methodology is presented for relating the generation and/or the consumption of heat and electrical energy to the rate of CO₂, NO₂, and SO₂ emissions to the environment. Two indices are provided for the precise determination of emissions of these gases to the atmosphere and are of help in the analysis and comparison of the quality and efficiency of energy options. The indices have no linear dependency on energy consumptions (unlike EIA and EPA methodologies) and can be applied to any industry in which heat or electricity is used. The new methodology requires minimal data, such as fossil fuel characteristics and heat flow through heaters and electrical energy consumption by fans, pumps, and compressors. Two case studies are provided to illustrate how the new methodology quantifies such emissions and how the technique can be employed in screening alternative technologies or designs.

Key words: climate change, energy consumption, energy efficiency index, exergy, impact assessment

Received: March, 2014; Revised final: June, 2014; Accepted: June, 2014; Published in final edited form: February 2018

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